THE END OF GOUT

By: Shelly Manning

Blue Heron Health News

-The End of Gout-

A comprehensive peasant's guide to dealing with the "disease of kings"

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"Only the wise can walk the road to true satisfaction…"

Introduction

Gout usually happens to people who live sedentary lifestyles, regularly eat rich creamy meaty meals, and regularly drink more than moderate amounts of alcohol on a frequent basis. A century or two ago such a lifestyle would only really be possible for the elite social classes of society, that is, the wealthy businessmen, aristocrats, and royalty. The average peasant was literally unable to get their hands on a regular supply of alcohol and meat, let alone live a sedentary lifestyle – working for their keep usually meant laboring for long hours in fields for little to no pay. This is why gout came to be known as, "the disease of kings".

Even in today's global fast paced developed world, meat still remains a symbol of wealth and status in many developing countries, cultures, and societies. However, in the postindustrial era of the developed urbanized first-world, many people live rather sedentary lives.

Modern work has changed from the simple serfdom of working in fields for hours on end of backbreaking physical labor in order to support feudal overlords. These days, people commonly work in offices sitting for most of the day. Even the commute to our workplace is mostly handled by mechanized transport of some kind. This change in work has led to far less physical day to day exercise for most of the population compared to periods in the middle-ages.

The modern economic context has also made far more foods and drinks available at affordable prices to the common people. It is easier now, than ever before, to buy meat and alcohol and live a sedentary life. Indeed, it may even be more expensive to buy healthy ingredients these days than it is to buy unhealthy foods that could contribute to gout. Not only is it easier to eat meat, drink alcohol, and rest for long periods, it is also easier to live a *longer* life. These days, people can eat and drink almost as lavishly as the aristocracy of old, but they can actually do it for many more years on end than people of old.

In a way, the prevalence of gout now can be seen as one negative side effect of the 'progress' modern society has made in improving life expectancy, infrastructure, and standards of living for the average person.

The disease of kings is no more a disease just for kings. It is now the common person, the 'peasants' of today's world, who are most at risk for gout – often the cheapest convenience foods tend to be the unhealthiest in the modern world. We aren't saying the destitute are more at risk, just that in general many more low to mid income people are at risk today than ever were in feudal times.

This is why we called our book a "…comprehensive peasant's guide…" This is not to say that you are a peasant! Please do not take offence. There are many things to be admired of peasants in terms of health - Physical activity, a simple down to earth diet, modest infrequent alcohol use.

These things have the highest pedigree when we consider health matters. We could say there is some peasant wisdom in being a healthy king!

This book is comprehensive because it covers every aspect of gout. We answer pretty much every question about gout, from “what is gout?” in chapter one, to “what must I specifically, practically do to remove gout?” in chapter five. We also cover everything in between these two questions too.

For those of you who want a solution for their gout, but don’t mind not understanding how the solution works, or why it works, we can recommend skipping to the final chapter of this book and following our guidelines carefully.

Nevertheless, if people want to jump straight to the practical solutions, then rest assured we have more than catered for that option. We do however urge each and every reader to dive into this book in order because each chapter introduces something important which builds on what the previous chapters have explored.

Aside from each chapter being interesting and useful in their own right, they do add together to give a complete and powerful picture of every aspect of gout. We think that having such a comprehensive picture would be an important contributor to the success of a gout recovery plan.

This book is intended to help people with gout remove their symptoms, and prevent any further gout from happening. Furthermore, gout is linked to a whole host of other scary conditions like heart problems, obesity, and diabetes, and because of that we have tailored our book to prevent such things in gout patients too.

We aimed this book at an educated lay person. That means that we have explained things in as much detail as we think is necessary to heal from gout, but not so much that you would feel like you are studying for a medical degree. The tone is kept light and informative, and there are useful tips and information all throughout the book that will help with your gout. We have not dumbed anything down, but we have kept things readable and informative – as we feel it should be.

Of course some sections are more information dense than others, but in those cases feel free to lightly skip over whatever seems too complicated, or too detailed for your tastes or mood. You won’t miss the most important information because we make sure to express the most important things for your gout healing in the simplest terms, and we keep mentioning the most important things time and again in the book so that you are never in doubt as to what you should know.

This book begins by exploring what gout is in chapter one. In chapter two we introduce one of the main areas linked with how to heal gout - your helpful friendly community of gut microbes, aka the microbiome. In chapter three we describe a whole bunch of exciting natural tools that are

able to treat different aspects of gout, things like cherries, powerful vitamins, powerful natural and safe pain relievers, and so on.

In chapter four, the longest chapter, we look at themes in people's lives that contribute to gout – things like stress, exercise, sleeping, diet and eating. Chapter four is an amazing look at the best ways to reverse and prevent gout with your lifestyle choices.

Finally, in chapter five, we make specific practical recommendations as to what we think people can do daily to beat their gout. In Chapter five we basically use the information in chapters 1 through 4 to recommend specific foods, supplements, and other things that are great for gout. We give specific instructions that cover a great 7 day repeating plan that you can follow to end gout completely.

We have also included a set of useful and informative appendices at the very end of the book. These appendices are loaded with convenient reference information that would be easier to find at the end of the book than if the information were tucked away in one of the chapters. The appendices make it easier for the reader to refer to important useful information that might be relevant across many different sections and chapters. They are also convenient sources of quick reference for use whenever needed, for whatever purpose. We encourage you to use them frequently as you eliminate your gout.

Indeed, that is our ultimate aim with the book. We hope it brings some measure of benefit to the many millions of people with gout, as well as to their families, friends, and lovers who would surely be happy to see them recover fully.

We wish you the best of success with your health and happiness.

For your health,

Shelly Manning

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Chapter 1

What is Gout? How is It Conventionally Understood?

What is Gout?

Gout is actually one of the oldest known specific forms of arthritis; it is also one of the most common forms. So, what makes gout, gout? In the simplest terms possible, what characterizes gout is uric acid, particularly little crystals of uric acid that form in the joints (and some other tissues). These crystals interfere with the mechanical action of joints and speed up wear and tear, essentially damaging the joints and causing painful inflammation and restricted movement.

Gout generally has active periods and passive periods. During an active period – a 'gout attack' – people experience painful inflammation in at least one of the joints in the extremities of the body (e.g. the knee, elbow, etc.). Short-lived (acute) attacks of gout are usually extremely painful and debilitating. Acute bouts of gout come on suddenly, cause tremendous discomfort, and then after a short time suddenly subside. Unfortunately, if people have a gout attack they are much more likely to have another gout attack, so this condition simply cannot be ignored.

It used to be that only the 'well to do' affluent members of society got gout with any regularity because in feudal times it was really only the wealthy who could afford to drink and eat meat with such excess and regularity to cause problems. However, in current times people have far more access to meat and alcohol and such foods and drinks are no longer the elite privilege of the upper classes alone. Indeed, such foods and drinks are usually cheaper and easier to procure than organic healthy vegetables, fruits, and ethically raised meat products. So, it seems that in modern times the old "disease of kings" has become the scourge of anyone. Highlighting this point is the fact that amongst adults in the United States, at least 3.9% have gout or suffer from gout attacks of which two-thirds happen to be men.[1] Indeed, in the period from 1997 to 2007 the frequency of gout in the U.S. population of adults increased by a staggering 44%.[2]

It is unfortunate that gout is preventable yet millions around the world suffer from it. Essentially, the things that put people most at risk for gout are lifestyle choices – e.g. what we eat, drink, and whether we exercise (or not) on a regular basis. Although there are more risk factors for gout than just this, the main variables under our control that we can leverage to prevent it are principally lifestyle factors. Nevertheless, whether it is preventing gout, or curing it, the solutions we suggest will come later in this book. For now, we need to understand gout properly, then we can understand the solutions that are available, and why they should work for you.

The Main Risk Factor For Gout – Too Much Uric Acid

The main issue for gout is having too much uric acid in the blood – a condition called "hyperuricemia" ("hyper" = a lot; "uric" = related to uric acid; and "-emia" = related to the blood). Not all people with hyperuricemia get gout, but all people with gout have hyperuricemia.

At any one time, it has been estimated that *at least* 20% of the US population have hyperuricemia, and, as people age the incidence doubles, with twice as many people in older age groups having the condition compared to lower age groups.[3]

So, having hyperuricemia actually increases a person's risk for gout substantially. But, this is not all that hyperuricemia puts people at risk for. It turns out that having too much uric acid in the blood can actually increase our risks for a number of other horrible conditions too and we will explore this area in some detail in a section to come. For now, we briefly mention three examples of other conditions that hyperuricemia plays a significant role in:

- High blood pressure (hypertension)
- Serious kidney problems (renal disease)
- Metabolic problems (so-called metabolic syndrome)

It is also worth briefly mentioning here that other diseases or negative health conditions can contribute to having hyperuricemia too; more on this to come in a later section.

Although people who suffer from gout experience periods of no symptoms, even during these asymptomatic periods their uric acid levels are too high. Also, during asymptomatic periods, their bodies are still experiencing a chronic form of low-grade inflammation. So although people with gout go through periods of 'no symptoms' and seem totally fine and healthy, the truth is that at the cellular level their body is still 'sick with gout'.

So we can see that the main risk factor is hyperuricemia. But, this doesn't explain what causes hyperuricemia, nor does it tell us anything particularly useful, yet. What would be more useful is to know what the risk factors are for hyperuricemia. In that case, we can indirectly say that those factors (the ones for hyperuricemia) are the things we can focus on to have the most powerful benefit for gout. Indeed we will look at this exact theme in the very next section.

Uric Acid – A Deeper Story

If uric acid is so unhealthy, then why is it there, where does it come from, how do we keep it in balance, and how does too much lead to gout? The answers to these questions will all come from understanding a little bit about uric acid metabolism in the body, and this is what we'll be discussing here.

Uric acid is a byproduct of our metabolism, particularly when we make or ingest things called "purines". Purines are the chemical building blocks of DNA and RNA, they are also used in the production and regulation of chemical energy in the body – they are super important for life.

So, given that purines are really important for our biological survival, human bodies evolved a way to create them from building blocks in our diet. This is where uric acid comes in because uric acid is a byproduct of the metabolism process of purines in the body.

So what does this mean in simple terms? In mammals, most of the purines in their diet are used by their bodies for other things like making DNA/RNA and regulating energy production. However, if there are excess purines in the body then these need to be 'thrown out', i.e. excreted.

Most mammals take excess purines and process them in the liver first, then they send whatever is left after the liver is done to the kidneys which release the unneeded compounds from the body in urine. For most mammals, excess purines are converted into an intermediate compound, uric acid, which is then acted on by an enzyme called uricase. Uricase converts uric acid into a new compound called allantoin. Allantoin dissolves easily in water, which means that this process is a good way to allow the kidneys to excrete the excess. So, for most mammals, they deal with excess purines by converting them to uric acid, then converting the uric acid into allantoin, which is then dumped out of the body in the urine.

This is a great system and it works very efficiently. But, unfortunately, humans lack the enzyme uricase! This means that unlike most mammals, in humans the process stops at uric acid - which is much less soluble.

So, we can see that if we eat excessive sources of purines in our diet then we will have to excrete more uric acid. If our system is working fine and our diet isn't too excessive then we should be able to keep our blood uric acid levels in a healthy range. But, as we already know, for people with gout something has gone wrong and levels of uric acid build up in the blood leading to many different problems.

What affects our blood levels of uric acid? Two main physiological factors affect our blood uric acid levels. The first is how much uric acid the liver is making, and the second is how much our kidneys can excrete.

The liver makes uric acid from the excess purines made by the body or eaten in our diet. This is where the uric acid comes from, however, the more powerful factor of the two influences on blood uric acid levels are the kidneys – it has the greatest effect. It turns out that about 90% of hyperuricemia cases are caused by problems with the kidneys excreting uric acid, and not problems in the production or supply of purines.[4]

If the kidneys are having problems excreting uric acid it is usually because it is having problems with two of its special transporter molecules. The two transporter molecules in question are called the "kidney urate transporter" (referred to as the "URAT1" transporter), and the "organic ion transporter" (OAT). Both of these special transporters work to control the movement of uric acid from the body into the urine. If these transporters aren't working properly then the kidneys don't excrete enough uric acid and we get a build-up of uric acid levels in the blood.[5]

Interestingly, when the kidneys are functioning properly, optimally, then they only excrete about 10% of the uric acid that comes to them. Indeed, 90% of the uric acid that goes to the kidneys is recycled back into the bloodstream. This is interesting because when it comes to 'mother nature'

and biology, nothing is wasted, and nothing is a 'mistake'. There must be some reason that the body recycles 90% of its uric acid back to the bloodstream. So, even though people refer to uric acid as a waste product, a byproduct of purine metabolism, the truth is most likely that the body uses uric acid for some important reason because it evolved the ability to recycle 90% of its uric acid blood levels.[6]

So, why would a healthy kidney recycle 90% of the uric acid it receives? One reason suggested for this is that it is probably likely that uric acid plays a role as an antioxidant in body fluids and that it can be responsible for removing at least 50% of the free radicals that enter our bloodstreams.[7] The idea that the human body evolved the capacity to recycle uric acid back to the bloodstream is supported by other ideas and observations. Primates (including humans), do not have the internal biochemical machinery to manufacture their own vitamin C which is a major antioxidant for the blood. [8] So, it makes sense that some alternative adaptation evolved to achieve something similar – uric acid is perhaps that alternative.

Consider that uric acid levels in human blood are six times greater than vitamin C (ten times greater than what is seen in some other mammals).[9] Uric acid also seems to play a similar role to vitamin C when it protects tissues with lots of oxygen from damage (tissues like blood, and brain tissue). The uric acid recycling mechanism in humans seems to increase the 'antioxidant capacity' of the blood and low uric acid levels in the blood are linked to bad health problems like AMS (amyotrophic lateral sclerosis) [10], MS (multiple sclerosis) [11], Alzheimer's disease[12], Parkinson's disease[13], and Huntington's disease – in other words, low uric acid levels are linked to damage to nerves and the systems around nerves. [14] [15]

Nevertheless, this is just well reasoned speculative evolutionary biology, not necessarily anywhere close to being a hard fact about the world. Although it seems there is both an advantage and a need for blood uric acid, it is more important in the case of gout to explore the fact that this useful mechanism has become wholly unbalanced for some reason - we want to find a way to help the body restore balance to this system and cure our gout.

Hyperuricemia and the Development of Gout

So far we have talked about gout and described how hyperuricemia is linked to gout, but we haven't actually described why hyperuricemia might lead to gout – i.e. what is the process, and what should we know so that we can understand how to tackle gout?

We discuss these particular issues as well as other related themes in this section. This is a great section to understand in a general way because this section will point out the mechanisms and processes in play when blood uric acid levels are high - ultimately leading to gout. All the 'key players' in these processes might have an important role to play when we decide later on the best methods to tackle gout effectively. If we know what's going on, then we are empowered to make the best-informed healing choices.

Uric acid dissolves poorly in body fluids, however, it has potent antioxidant action in those fluids when dissolved. This means that levels of uric acid would need to be high so that at least some of it dissolves properly to act as an antioxidant, but not so high that there is an excess amount that forms crystals. How much is too much though? For men, the upper limit for normal levels is considered to be 8.6mg of uric acid per liter of blood, and for women, the value is considered to be around 7.1mg per liter. If people have more than these levels then they are considered to be hyperuricemic by definition.[16] [17] [18]

Although hyperuricemia is the primary risk factor for gout, many people with hyperuricemia will not go on to develop gout symptoms.[19] The risk of gout attacks rises with increases in blood uric acid levels, but the chances of developing the disease are relatively low in any case. For example, people with uric acid levels between 7.0 and 8.9 mg/liter have a maximum increased risk of about 3%, whilst levels of 9.0 mg/liter or above hover around 4.5%.[20] But, don't be fooled by the low percentages because even though they are low, the sheer number of people with hyperuricemia means that even these low percentages translate to millions of people who get gout attacks.

Alarmingly, hyperuricemia is also a risk factor for other diseases and conditions, and even when people with hyperuricemia have no negative health symptoms research studies have shown that up to 33% of asymptomatic hyperuricemic patients will have inflammation and urate deposits in their joints and surrounding tissues.[21] This means that the absence of symptoms doesn't mean that your hyperuricemia is nothing to worry about. We will discuss the other conditions that hyperuricemia is linked to in a later section.

So what's the basic idea? The short of it is that as our blood levels of uric acid rise the concentration gets to a point where no more uric acid will dissolve. At this point, the uric acid starts to 'come out' of the blood solution in the form of crystals – monosodium urate crystals. These monosodium urate crystals are shaped like little spikes or needles, and they get preferentially deposited in cartilage and joint tissues. These sharp little crystals can sit in the joints and cartilage for years without causing any problems because they are so tiny – most of the time they simply get reabsorbed back into the blood.[22]

Ultimately speaking there are two things that can happen to these little crystal deposits in the joints, they can be reabsorbed out of the tissues, or they can be 'shed' off the tissue into the surrounding spaces and fluids of the joint. If the little crystals are shed into the joint fluid spaces they get 'eaten' up by immune cells causing an inflammatory response – this inflammation is a side effect of the activity of the immune cells in the joint area. This inflammation is what contributes to the gout style of arthritis and is the main cause of all the discomfort and pain associated with gout.[23]

Gout Attacks

We previously mentioned that Gout has two distinct phases or periods. It can either flare-up in an acute attack for a short period of time, or it can lie dormant with no symptoms at all. Over time if crystal deposits keep forming then people with gout can also develop a more chronic or persistent form which provides more constant discomfort.

So how do acute gout attacks happen? Sudden and severe gout attacks are usually first experienced as a severe inflamed arthritis attack in one of the joints (usually in the lower legs, like the ball of the foot or 'big toe' –gout attacks in the foot or big toe is often called "podagral"). Other joints that are frequently affected in gout attacks include the mid-foot, ankle, knee, wrists, or finger joints.

Gout attacks usually start in the morning and then gradually become more and more intense, reaching a peak anywhere between 6 and 24hours after the initial onset. The skin at an area of a gout attack is very often reddish, inflamed, and shiny looking. However, as any gout victim will say, the main issue with an attack is pain at the area. The pain is felt like an overwhelming sensitivity and many people can't wear socks or even touch bed sheets with the affected area during an attack.[24]

Attacks subside or go away in less than two weeks at most, but usually, attacks start easing off after a few days. Finally, gout attacks can present with high fevers and raised white blood cell counts – indicating some kind of active immune system response, but fevers need not always be present either.[25]

What might trigger an attack?

There are a variety of factors that might trigger an attack of gout. In general, these factors usually work by reducing the solubility of urate in the blood. Examples of the kinds of triggers that do this can include:

- Infections
- Physical trauma to the joint
- Unusual and rapid weight loss
- Dehydration
- High blood acidity (acidosis)
- Lower body temperatures

Uric acid is more soluble at warmer temperatures, so lower temperatures decrease its solubility. This is why the extremities of the body (e.g. the feet, ankles, toes, fingers, etc.) are more likely to suffer gout attacks than parts of the body closer to the trunk. Also, our body temperature lowers slightly during sleep which could account somewhat for the fact that gout attacks start in the morning upon waking.[26]

After the active phase of an 'attack' subsides, a person with gout enters what is called an 'inter-critical' phase or period i.e. a phase where there are no symptoms. Even though there are no symptoms during this period, careful scientific research has shown that in almost all cases low-grade inflammation and urate crystals are still present in the joints, especially the previously affected joints.[27]

It is unfortunate, but statistical analysis has shown that once a person has a gout attack, they are much more likely to have another one – with each subsequent attack making it even more likely to have another attack. This might be because of what happens during an attack or it might be because of the kinds of factors in one's behavior and lifestyle that keep recurring. The most likely explanation for this ever-increasing likelihood of having gout attacks is a combination of lifestyle activity and the physical factors that happen to the body during an attack of gout.

As mentioned, some people that have had attacks of gout over a longer period can end up developing a more chronic, or persistent form of gout. This more persistent, constant, chronic form of gout is called "chronic tophaceous gout" which is characterized by urate crystals being deposited in a more widespread fashion. The urate crystal deposits in soft tissues linked to chronic tophaceous gout are called "tophi". These tophi can accumulate in and around the joints ultimately leading to joint erosion, and negatively affecting bone cell growth. If chronic gout-like this is left too long without making some kind of intervention or change to address it then severe impairment is usually what results – impaired movement and pain, and reductions in one's quality of life along with multiple measures as a result of impaired function and pain, including social impairments.[28] [29]

Hyperuricemia and Other Conditions

We know that hyperuricemia (the condition of having too much uric acid in the blood) is linked to gout. It makes sense that high levels of uric acid would lead to higher chances of gout, especially given our discussion so far, but what we have not discussed is the fact that hyperuricemia is also linked to other problems and disorders.

It turns out that both hyperuricemia and gout are major risk factors for developing kidney problems and kidney stones. Gout and hyperuricemia both make it more likely to produce uric acid stones and calcium-based stones. Kidney (and bladder) stones are usually made from calcium oxalate, and having gout or hyperuricemia (or both) increases the risk of us forming these kinds of stones too. In fact, in people with gout, the presence of calcium oxalate stones is anywhere from 10x to 30x higher than for people without gout.[30]

Crystals from uric acid (monosodium urate crystals) that are deposited in kidney tissues can lead to kidney damage in two main ways. Firstly the crystals can form in the tiny tubules of the kidney causing damage directly or, they can induce chronic inflammation in other parts of the kidney which can also lead to serious damage over time.[31] 40% of all gout patients developed

kidney disease before treatments were developed that lowered levels of uric acid. Typically, in patients with gout in those times, nearly one in four died from kidney failure.[32]

Hyperuricemia is also a risk for our heart and blood vessel health (cardiovascular health), particularly in people who already have high risks for cardiovascular disease. For example, hyperuricemia has been shown to slightly increase the likelihood of negative heart events, heart failure, and strokes.[33] [34] [35]

Traditionally speaking, high blood pressure was linked to hyperuricemia. Earlier research strongly suggested that high blood pressure (hypertension) contributed to hyperuricemia - possibly due to the effects of high blood pressure on the kidneys.[36] But, more recent research seems to be suggesting that the less uric acid we have in our blood, the greater our chances to have high blood pressure – sometimes the increase in chances for high blood pressure was recorded to be as much as 13% - the effect was higher for women and young adults than for other groups.[37] Interestingly, one study showed that when we lowered uric acid levels in adolescents who also had high blood pressure, then their blood pressure measures reduced.[38]

So, the results on the links between hyperuricemia and blood pressure are mixed, and a little confusing, but the results linking hyperuricemia to increased heart disease risks are strong. This seems to imply that the negative effects on our heart and blood vessel health seen in hyperuricemic patients are probably not to do with uric acid effects on blood pressure, but rather from some other mechanism. One suggestion proposed for this mechanism is that increased uric acid formation might result in increases in free radicals that damage the blood vessels or heart, although more studies need to be done to find out exactly what is going on.[39] Suffice it to say that everyone agrees that hyperuricemia increases your risks for bad heart and blood vessel health, even though its relationship to blood pressure isn't so clear.

Another disorder that hyperuricemia seems to play a role in is one called "metabolic syndrome".[40] Studies have shown that higher uric acid levels have massively increased people's risks for metabolic syndrome AND vice versa![41] [42]

Now, for those that don't know, metabolic syndrome is a general term for problems in metabolism that affect the way the body handles the storage and generation of energy. So, diabetes can be considered a specific disease that would fall under a metabolic disorder. One study showed that hyperuricemia is strongly linked to increased diabetes risks and that men with gout can have as much as a 41% increased risk for diabetes than men without gout.[43] So hyperuricemia can increase our risks for diabetes and other metabolic problems, men with gout are at much higher risk for diabetes too.

All in all, we can see that having hyperuricemia is an undesirable condition for the body to be in – it comes with increased heart risks, risks for diabetes, and major risks for the kidneys; not to even mention gout and its painful symptoms.

Other Risk Factors for Gout

Hyperuricemia is considered the "primary" risk factor for gout. What this means is that for a doctor to diagnose you with gout he has to find that you have hyperuricemia – it is a 'necessary' condition for gout. But, hyperuricemia is not sufficient on its own to guarantee that you will get gout – meaning that it is insufficient on its own for gout. This means that there must be other risk factors for gout too, and we will explore them in this section.

Here is a brief list of the other main risk factors important for gout:

- Increasing age means increasing risk.
- Gout is more common in men.
- Other medical conditions can make gout more likely, e.g.:
    - High blood pressure (hypertension)
    - Obesity
    - Kidney insufficiency (aka Renal insufficiency)
    - Early-onset of menopause in women.
    - Very high blood levels of cholesterol (Hypercholesterolemia).
    - Having sugary drinks or foods are linked to increased risks.
- Certain medications are known to cause increased risks for gout, and when stopped the risks for gout go away, e.g.:
    - Certain diuretics (drugs that affect the kidney and increase urination), some anti-tuberculous drugs, cyclosporine, and levodopa all raise the risk for gout.[44] [45] [46] [47]
    - Aspirin can either reduce OR raise uric acid levels. At low doses, it raises levels of uric acid, whilst at very high doses it reduces them – e.g. elderly patients who took 75mg aspirin per day had about 6% more uric acid than those who did not; doses of 3000mg or more aspirin per day were associated with decreased blood uric acid.[48] [49]
- Dietary Factors have a major impact on uric acid levels and can clearly impact a person's risk for gout, e.g.:
    - Eating a lot of high-purine foods like red meat, fish and shellfish will increase gout risk and raise uric acid levels.
        - A study that tracked more than 47000 (!) health professionals over a twelve-year period showed that people who ate the most beef, pork, or lamb (2 or more servings per day) or seafood (average more than 0.6 servings per day) had a staggering 77% and 55% increased risk of gout respectively![50]

Interestingly, there is no link between how much total protein one eats and gout. Nor is there any link in the same fashion between how much animal protein (including dairy, eggs, and poultry), and purine-rich vegetable protein one eats and the incidence of gout. This implies that it is not so much the total amount of protein ingested but rather the type of protein ingested and whether it is

purine-rich, along with some other factor (such as frequency, or some other compound) which makes the difference.

- Drinking alcohol increases gout risk and raises uric acid levels.[51] [52]
    - How strong is this effect? One study found that in people who drank one beer per day on average (or one serving of spirits per day on average) had as much as a 75% greater incidence of gout (22% greater for spirits) than those who drank less than one drink per month. More than 2 beers per day increased gout risk by a whopping 2.5x.[53]
    - Interestingly, for many years scientists considered wine to have zero impact on gout risk. However, in 2014 studies began to appear that proved this was not the case. We now know that *all* alcohol increases a person's risk for debilitating gout attacks.[54]

Why would alcohol induce gout? It has to do with the way alcohol affects metabolism and raises blood uric acid levels. Also, alcohol use affects the functioning of the kidneys, may contribute to dehydration, and lower body temperature in the extremities – all of these are risk factors for gout, with lower temperature able to induce an attack of gout regardless of blood uric acid concentrations.[55] [56]

Finally, beer is the worst offender for gout even though it has less alcohol content per serving than most other drinks. This is because beer has naturally high levels of purines *and* contains alcohol - unlike most other alcoholic drinks.[57]

- Fructose and some other sugars are linked to gout and hyperuricemia. Although results have been mixed with some studies showing no link, and many showing some kind of link. A survey of more than 14 500 people over the age of 20 years showed that people who drank one or more sweetened soft drinks per day had blood uric acid levels that were on average 0.5mg per liter higher than those who did not.[58]
    - Later studies done on more recent data have not shown the same correlations.[59] These mixed results imply that fructose levels and blood uric acid levels are affected by some other factor not directly linked to sugar consumption on its own.[60] Nevertheless, there is recent data from 2016 that does show that risks for gout increase with more sugar intake (particularly fructose), though the mechanism is not as yet completely clear.[61]
    - Fructose clearly Increases the risk of gout and cardiovascular disease (CVD).[62] (CVD is a major concern for obese individuals as well as diabetics)

So, from the conventional point of view gout is primarily linked to uric acid levels - hyperuricemia. There are many other factors that massively affect our chances of getting gout and these include diet, sugar, alcohol, frequency of purine food consumption, other diseases, medications, and much more.

We shall have more to say about the underlying causes of gout in a later section but for now, this is sufficient to understand the conventional view of gout and why doctors might attempt to diagnose and treat it the way that they do – which is, in fact, the topic of our next section.

How Gout is Diagnosed & Treated Conventionally

Most people who are diagnosed for gout go to their doctor or health professional of choice because they are in pain, usually in and around the joints in the feet and ankles. Gout commonly presents this way, with painful joints in the extremities and inflammation in those areas too. But, Gout is not the only condition that has these symptoms; other conditions can have exactly the same symptoms too. This means that there must be a way to rule out the other conditions in favor of gout being the correct explanation.

This is what a conventional doctor will attempt to do when they diagnose you. They will usually assess your symptoms, take your case history and context into account and narrow down the likely cause of your symptoms to one or more possibilities. Then they may need to do some testing to decide what's actually wrong with you – i.e. decide between one or other competing explanations for your symptoms. If the last explanation standing for your symptoms is gout, then that, along with some positive indication for gout will usually lead to a diagnosis.

Two common conditions that have the same symptoms as gout, (but aren't gout) include "pseudogout" and "septic arthritis". Pseudogout is very similar to gout and is characterized by a buildup of calcium crystals (calcium pyrophosphate) in the joint. Septic arthritis is an infection in the joint by a virus or organism.

To differentiate, doctors will usually begin by testing your blood levels of uric acid - since by definition it is necessary to have hyperuricemia in order to have gout. Blood tests are the way uric acid levels are tested for and readings above 7mg/liter in men or 6mg/liter in women are cause for concern.

But, we mentioned that hyperuricemia is only necessary for gout, not sufficient on its own for a diagnosis. Hyperuricemia is the most important risk factor for gout, but its usefulness or power for diagnosis is limited. Some people with hyperuricemia never get gout, and, more confusing still, during a gout attack your blood levels of uric acid might be in the normal range. For example, a research study found that 14% of gout patients had normal blood levels of uric acid during their gout attacks.[63]

According to some clear clinical guidelines, the most important feature in the diagnosis of gout is the detection, directly, of urate crystals (monosodium urate) in the fluid of the joints.[64] What this usually means is that your doctor may have to insert a needle into your joint and draw out a small sample of fluid for examination under a microscope to check for urate crystals.[65] This is the method that clearly differentiates between crystals that form in pseudogout, gout, and the symptoms associated with septic arthritis without urate crystals.

The other thing your doctor may do to absolutely confirm gout is to wait for a period where you have no symptoms and then check the joint fluids again. If during this asymptomatic phase urate crystals are found in the joints, then that would go a long way to confirm gout since it clearly shows a pattern of critical and intercritical periods – a classic feature of gout in non-chronic cases.

Because needling for joint fluid samples is unpleasant, many efforts have been made to be able to screen for uric acid crystals by using ultrasound for intercritical periods. This is a nicer way to check for urate crystals during calmer periods between flare-ups. The initial use of ultrasound for this purpose had a measured accuracy of 81% in 2011 – accuracy rates have slowly improved since then.[66]

Typical Conventional Treatments for Gout

For acute attacks of gout, conventional medical doctors will usually try to manage your pain and inflammation by using pharmaceutical drugs like NSAIDs (non-steroidal anti-inflammatory drugs, e.g. aspirin and others), steroidal based drugs (corticosteroids), or colchicine.

DID YOU KNOW…?

There are many long used traditional folk remedies for gout that have been reported as anecdotes that claim to radically reduce pain in mere hours. Check out the following recipe and see for yourself!

Quick Alkalinizing Folk Remedy

Mix together

- ½ Teaspoon Baking Soda (It's the same as Bicarbonate of Soda)
- Half a glass of pure filtered water

Take on an empty tummy twice daily – preferably in the morning and early evening

Only take this remedy for the duration of your acute attack since long-term use can cause serious metabolic imbalances. If your pain has not abated within 24 hours then discontinue using this particular remedy and try some of the other tools outlined below.

The treatments used conventionally for acute gout attacks are usually short term, like the attacks themselves. Unfortunately, even though the treatments are short-term (usually) there is still quite a risk for some patients because colchicine and NSAIDs can both negatively affect the stomach and intestines. Colchicine is not preferred over NSAIDs because it has what is known as a low

therapeutic index, meaning that it takes a lot of colchicine, close to a toxic amount, to get any benefit. Nevertheless, the FDA approved colchicine for use in gout cases, even though it is unlikely to be preferable to any other method.

Other treatment options that are often used include relieving the joints of pressure by removing some of the excess fluids in and around the joints (known as aspirating the joints) and injecting long-acting steroids. By the year 2006 doctors were commonly injecting long-acting steroids for gout, even though at that time such a procedure had very little scientific research behind it for gout. Nowadays such methods still continue even though research into the risks of such treatment has progressed modestly, if at all.[67]

So, after the intense pain of a gout attack calms down a doctor will usually switch gears and offer some suggestions on dietary and lifestyle changes to try to reduce hyperuricemia and any risks for gout attacks in future. In conjunction with such advice, doctors often put their gout patients on long term uric acid reduction therapy. Such therapy involves using pharmaceutical drugs to either actively interfere with the way uric acid is made in the body, or interfere with how uric acid is excreted from the body – depending on the therapy chosen.

Typical Drugs Used in Uric Acid Reduction Therapy

Xanthine oxidase inhibitors

Xanthine oxidase is the name of an enzyme in your liver that is crucial to the formation of uric acid. Chemicals that reduce the activity of this enzyme will reduce the amount of uric acid your liver forms. Typical examples of xanthine oxidase inhibitors include allopurinol (Zyloprim™, which has been used for ages); and febuxostat (Uloric™). Even though febuxostat reduces uric acid levels much more than allopurinol, they have no difference in their ability to prevent gout attacks.[68]

Uricosuric drugs

Uricosuric drugs prevent uric acid from being reabsorbed back into the blood – this promotes excretion of uric acid via the kidneys. Two good examples of some commonly used uricosuric drugs include probenecid (Benemid™), and sulfinpyrazone (Anturane™). These drugs can increase the amounts of uric acid in the kidneys (because less reabsorption is taking place) which makes it more likely that kidney stones could form.

Uricase Enzyme Based Drugs

Uricase is an enzyme that is not naturally found in humans. This is the enzyme we mentioned in a previous section that was able to convert uric acid into another much more water-soluble compound called allantoin. Pharmaceutical companies developed a synthetic injectable uricase-like enzyme for use in humans to try to convert uric acid to allantoin - thus helping to reduce the amount of uric acid in gout patients. Two examples of such a therapeutic enzyme that have been used include rasburicase (Elitek™), and an alternative, modified version of the same enzyme called pegloticase (Krystexxa™) which was approved for gout treatment way back in 2010.[69] [70]

Pegloticase is known to cause some negative side effects, including major allergic reactions at the site of injection. This means that for many people to take this treatment they may have to suppress their own immune systems with corticosteroids at the same time so as to reduce the reaction.[71]

Surgical Options

Finally, although not a pharmaceutical drug-based intervention, surgery is sometimes used when gout is so severe that drug treatment is seen as insufficient – e.g. in gout cases where the joint is severely deformed or dysfunctional. [72] [73]

Typical Conventional treatment (management) strategies might include:

- Pharmaceutical medications to try help reduce the symptoms of acute gout attacks. Usually, doctors would prescribe or suggest the use of NSAIDs (non-steroidal anti-inflammatories like aspirin), or corticosteroids, or a combination.
- Pharmaceutical drugs to try to reduce uric acid in the joints. Examples might include drugs that are called "xanthine oxidase inhibitors" (e.g. allopurinol). Other medications might be used such as 'uricosuric' medications which help you to get rid of excess uric acid by promoting the excretion of it.

Newer Conventional Treatment Strategies

Conventional treatments may also include the use of injectable drugs with an enzyme called uricase. Uricase is an enzyme that humans do not naturally produce. This enzyme is able to convert uric acid into a compound called allantoin which allows excess uric acid to be removed from the blood. This treatment method is relatively newer and as such has seen less use than the ones mentioned in the previous section, however, it is still worth a mention.

Chapter 2 – Our Helpful Friends

The Gut Microbiome

What exactly *is* the microbiome?

In non-technical terms, the gut microbiome refers to two things. Firstly, it refers to the collective population of little organisms that naturally live in the human gut, and secondly, it can refer to the environment present in the gut that impacts the little organisms too. You can think of the gut microbiome as referring to a city in your gut that is populated by many tiny little organisms like helpful viruses and bacteria – naturally, the city's living environment has an impact on its sensitive citizens.

Getting a little more technical, the term "gut microbiome" refers to the microenvironment of our gastrointestinal tract (GIT) and all the genes it contains. This term includes the trillions (literally trillions!) of different micro-organism that our gut hosts in our bodies. In fact, the research that we are about to explore has even sparked new debates about what it means to be human from a physical point of view. This is because scientists have discovered that for every one human cell in our bodies, we have at between 9 and 15 non-human parts that are micro-organisms such as bacteria, viruses, fungi, and yeasts – an utterly astonishing fact.[74]

How many micro-organisms does an average adult have in the body? Experts estimate that the total number of tiny organisms that make up our microbiome is somewhere in a range between 50 - 100 trillion. Given these estimates, some scientists even view the human body as a colony of human and microbial organisms.[75]

We host more viruses than most other types of organism[76] and many of these perform beneficial functions in our bodies. Interestingly viruses are often found living inside other, larger bacteria. These same bacteria often take up residence in yet slightly larger micro-organisms, which hang out in the gut or other parts of the body.

We usually think of viruses and bacteria as the 'bad guys', but in the case of the microbiome most of the little viruses, bacteria, and other organisms have evolved to hang out in the body where they benefit from the microenvironment, whilst the body benefits from them being there too - A sort of 'harmonious and cooperative relationship'.

So, not all viruses or bacteria are harmful, in fact, most of the ones we find naturally in the gut are beneficial to us in some way. For example, scientists have reported that these viruses are very good at decoding genetic material (RNA), and they tend to help bacteria out by transferring genes in bacteria to help them to quickly adapt to changes in the internal living environment of the gut.[77]

So, what's so interesting or important about the gut microbiome?

Let's start with why scientists became interested in the gut microbiome. It turns out that modern medical interest in the microbiome only began to rise quite late into the nineteen eighties before then it was only a small handful of academic biologists that wanted to study the gut biome. However, in the 1980s and then later in the early to mid-1990s interest in the gut-biome began to explode. This happened because research scientists came to realize that the gut (and it's associated systems) had lots of special receptor sites for neurotransmitters – more receptor sites than even the brain!

To really understand why this result is so surprising and interesting we should know that neurotransmitters are a special chemical that is involved in brain and nerve function. These are the chemicals associated with muscle functioning, moods, attention, body system co-ordination…everything really. It made sense to people that the brain would have tons of receptors for these important neurotransmitters, but the gut? Why would the gut has more even than the brain?[78] [79]

Science had basically discovered some basis for a "gut feeling", a 'thinking', 'feeling', and regulating gut – this is what produced all the interest, people really wanted to find out more about what exactly was going on here.

So, understandably the GI-system started to generate a huge amount of interest and since the late 1990s, a massive body of research has developed in this field. It was only natural that people would begin to investigate the relationship between the little colonies of bacteria, viruses and other organisms that were living there. It was only natural that people would start to investigate the complicated interrelationships between the environment of the gut, the citizens of the gut, and the health status of the internal system of the body. Many researchers continue to actively investigate the latest scientific points of interest in this field today.

One such 'point of interest', so to speak, is the discovery that yes, indeed, the gut environment including all the microorganisms found in normal healthy GI-systems impact health in multiple important ways. Broadly speaking, the two most powerful health conclusions that have emerged from this field so far are that our health is extremely dependent on what's going on in the microbiome of the GI-system, and, the reason for this is because the microbiome interacts very powerfully with important body systems like the immune system, systems of energy production, other systems of metabolism, and nutrition.

These recent discoveries are showing us that the microbiome is one of the most important factors that determine how healthy or unhealthy we really are. Every single discipline in medicine is being affected by this research and it might even pave the way towards a new understanding of the interactive dynamic nature of all these systems that operate together – something which already seems to be happening.

Gut Health is Very Important for Human Health

The revelation "gut health is important for human health" may not strike most people as all that profound since it seems obvious - it makes sense. But, what people may not know, and what made this discovery so impressive to scientists, in particular, is not that gut health was merely important to health, but rather the fact that gut health was *so* important, and that its effects were largely due to the activity of the microorganisms found in the gut itself.

The roles played by our microbiome are so vast that many scientists are beginning to question whether the microbiome can be viewed as an organ in its own right! [80] We have all heard about these organisms but in general, we tend to associate them with causing disease in our bodies and not with being healthy. But, as we mentioned earlier, it turns out that most organisms in our gut microbiome (up to 95% of them) are beneficial for our health. It is only really about 5% that produce unhealthy pathogenic conditions in our bodies, and this only happens when these unhealthy bacteria proliferate out of balance relative to the good organisms in our gut microbiome. The collection of total organisms in our microbiome is known as the microbiota, and our body serves to function as their permanent place of residence – We are their home.[81]

Natural therapists and traditional healers have known about the importance of our gastro-intestinal-tract ecology for centuries using the concept of "homeostasis" to guide their patients to wellbeing. Homeostasis is simply the principle that the body, and especially the gut environment, needs to be in a state of balance to be healthy. Any imbalance in homeostasis results in disorders that eventually cause disease. Redefining this principle in today's language, and taking into account the importance of the microbiome, we could say:

If our gut microbiome is a balanced healthy environment, teeming with a diversity of positive beneficial organisms, then our body would likely be in a good healthy state of homeostasis which supports a happy and thriving lifestyle.[82]

The gut is one part of the body that comes directly into contact with the external environment and it has a primary role in managing how certain external environmental contacts are managed in relationship with the internal environment of the body. This might sound strange to many people because the gut seems so 'internal' to the human body; the gut is 'out of sight' after all. However, the gut is far from 'internal' because it constantly interacts with anything we eat or drink, and is subject to any external environmental factors that affect the things we ingest.

So, our GIT is actually a lot like our skin, just that instead of covering the outside of the body it covers our internal body. If you see the GIT in this way it is easy to understand that we aren't really 'separate' from our physical environments and that what is going on around us is linked directly to what is going on within us. In a very real sense, the events of our internal biology will always mirror factors in the external environment in some way - the critical interface between the two is the microbiome.

If our surroundings are polluted, then our body will be polluted too. It's easy to see that if we consume contaminated products, use impure water, or breathe polluted air, then our health will be negatively impacted. This negative impact from the environment will be reflected in the state of our microbiome. How exactly? Well, the external environment along with our lifestyle choices directly determines the ratios of different types of organisms (microbiota) that collectively make up our microbiome. This means that whatever we do has an impact on our gut environment. [83]

This might sound like a weakness of the human body, but that isn't the case. The very responsiveness of the microbiome to our daily habits and environment is exactly what we require to be able to change it for our benefit. We are responsible for it, and its state of disease or health is explainable in terms of things we can directly control. In other words, we can directly influence the composition of our microbiome by making precise selective choices with regard to what we drink, eat, how much we exercise, how and how much we sleep, and how we manage our stress.

Our gut must be able to handle whatever is thrown at it and process these external factors for the benefit of the body's internal environment. What does a healthy gut need in order to deal with its day to day tasks? A healthy gut needs a healthy immune system, as well as near perfect anatomical and physiological functioning. Without appropriate gut health, humans become vulnerable to infection, poisoning, malnourishment, and a whole range of degenerative and lifestyle disorders.

So, to recap a little bit,

Each of us has a unique set of microorganisms living in an essentially unique micro-environment. What we eat, drink and do affects the environment of our GIT and largely determines what kinds of microbiota and in what ratios they occur in at any particular time.[84] This is extremely important to us because the gut microbiome influences multiple body mechanisms and systems that impact our health and wellbeing - even down to human genetic mechanisms. [85] [86]

One of the most numerous of the microbiota is bacteria, with estimates of their population numbers in an average human microbiome ranging between 30 and 50 trillion.[87] This is a truly staggering number if you stop to think that the total number of human cells in a human body is estimated to be around 37 trillion. What this means, in a sense, is that we are at least 50% bacteria since there are just as many bacteria as there are human cells – a possibly disconcerting thought.[88]

Bacteria are not the only microbiota of importance in the gut microbiome, nor are they the most numerous members – viruses are. It turns out that viruses are the most numerous of the various citizens of our gut.[89] [90]

Most people think of viruses as enemies to health – as harmful disease-causing nuisances. However, many viruses exist that don't cause us harm, and indeed there are actually many helpful viruses in the microbiome. The viruses of the human microbiome usually make their homes inside the bacteria found there.

It turns out that almost all of the viruses normally found in a natural healthy human microbiome work together in beneficial ways with the bacteria found there. Viruses within bacteria in the microbiome often help to splice genetic material to quickly transfer genes in response to environmental demands – beneficial genes.[91]

In recognition of the importance of the microbiome to our overall state of health, The Human Microbiome Project (HMP) was formed in 2008 to co-ordinate research programs, generate funding and collect data to further our understanding in this area.[92]

The General Importance of the Gut Microbiome

What are the roles that the microbiome fulfills in the human body? Well, it turns out that the microbiome can fulfill so many different roles in the body that some scientists have begun thinking of it as a whole new body organ.[93] To prove our point somewhat take a look at a short list of some of this new 'organ's' main functions below:

The microbiome can…

- Impacts the rate at which we mature.
- Modulate the digestive system…[94]
  - Contributes to plant sugar (polysaccharide) digestion
  - Very important for extracting and forming Vitamin K, many B-vitamins, and some short-chain lipids. [95]
  - Affects the base rate of metabolism (which means that the microbiome is an important factor for gaining and losing weight, amongst other things) [96]
  - A good and healthy microbiome will improve the nutritional value of the food one eats. This is because the microbiome provides important enzymes to break down complex nutrients from the diet – without these enzymes, the human body would have no way to access these sources of nutrition.[97]
- The state of the microbiome affects mood, behavior and other brain functions. This is because of something called the "Gut-brain axis" (GBA) and the way neurotransmitters and receptors found in the gut influence nerve function.
  - The GBA is very important for:
    - Moderating stress in the body.[98]
    - Memory, attention, and mood.[99]
- The microbiome affects the way our immune system matures from infancy as well as the way our immune system functions from day to day.[100] [101] [102] [103]

Hopefully, it is clear why the gut microbiome is very important for our general health. We should be looking after it by making sure that we encourage happy healthy microbiota to

flourish, whilst at the same time we discourage less beneficial or harmful microbiota from doing the same.

The Composition of the Microbiome & How it Develops

So where do we get our gut bacteria from? How does it change as we grow up and age? What makes one person have one kind of microbiome, and another person has something different?

It all starts at birth (and possibly in utero too). From birth onwards, the human body is exposed to vast numbers of microorganisms. This exposure is normal and healthy and serves to prepare the immune system for maturity. In fact, we need this exposure to help our immune system learn to fight off common ailments and invaders.[104] [105]

What factors affect the composition, the kinds of organisms and numbers of them in the gut at birth? Research seems to indicate that the place of birth[106] and style of birth[107] affects the initial bacterial colony compositions in the early microbiome. Infants born vaginally tend to have Lactobacillus bacterial colonies, whilst those born via caesarian section are dominated largely by Staphylococcus, Corynebacterium, and Propionibacterium colonies – these last three are typically found on the skin and contact surfaces in the environment whilst the lactobacilli are predominant in the vagina. Whether the baby was born at home or the hospital can also affect the composition of the baby's microbiota. [108] [109]

Initially, the diversity of microbiota is limited to about 100 different species, but by the age of three years that number grows to about ten times as much which is close to the microbiota of a mature adult. Further changes are often recorded in puberty and menopause, but many changes in the diversity and composition of these little organisms are seen over one's whole life as a response to multiple environmental factors.[110]

The following types of bacteria are commonly found in the GIT (in particular the large intestine):

- Bifidobacterium, Lactobacillus, Bacteroides, Clostridium, Escherichia, Streptococcus, and Ruminococcus.
- Each bacterium type is in relative balance or equilibrium with the others and the GIT environment (in healthy individuals).

The Factors that Influence our 'Micro-friends'

In general, the following factors really support the health of our beneficial microbiota:[111]

- Exercise
- Drinking enough water consistently
- High-fiber intake
- Eating more complex carbohydrates than simple ones.
- Eating a balanced, colorful, varied and diverse diet is really beneficial

The factors that have a negative impact on our microbiome composition include: [112]

- Antibiotics (medications)
- Excessive sugar intake
- Chronically high levels of stress
- Not doing the things on the previous list to support the 'good guys', e.g. A diet that lacks variety, sedentary lifestyle, not enough water, etc.
- Anything that radically alters the environment in the gut will also radically alter which organisms you'll find there.
    - E.g. things that inflame the gut and stomach, things that change the acidity of the gut, or things that make the gut super permeable (e.g. binge alcohol consumption) would definitely not support the 'good guys'.

Antibiotics are particularly devastating to the helpful little critters in our gut because medications that are antibiotic tend to act like 'nuclear bombs' in the gut.

The great thing about antibiotics is that they can wipe out extremely toxic and harmful bacteria during dangerous infections - this can sometimes prevent death in extreme emergency situations. Unfortunately, the toxicity needed to kill wild raging bacterial infections comes at a price. That same toxicity also acts on the 95% of bacteria that are the good friendly guys. This is because antibiotics don't really discriminate between good or bad bacteria - The name 'antibiotic' literally means 'anti-life' after all.

This is why probiotics are often recommended after antibiotic courses to repatriate the gut flora. Something called "prebiotics" is also often given. Prebiotics are slow-digesting, or non-digestible fibers (often plant materials) that provide useful nutrients to the probiotic organisms. The combo of prebiotic nutrients and probiotic bacteria helps to establish happy beneficial colonies in the gut which goes a long way to supporting many of the body's health and nutritional needs.

Gout & The Microbiome

Scientists have looked at the gut microbiome profiles of people with gout. What they found was interesting, and the main points are listed below:

- There are clear differences in the kinds of little organisms that flourish in gout patients compared to healthy people. [113] [114] [115]
- There are also almost identical differences between people who are on uric acid therapy (for hyperuricemia) compared to healthy people. The therapy itself changes the microbiome, even though the microbiome of people with hyperuricemia is different from healthy people to start with. [116]
- The differences in the microbiome between gout patients and healthy people are predictable and consistent – this means we can predict whether someone has gout or hyperuricemia just by looking at the microbiome and taking samples from the gut environment – the predictions have good accuracy in the literature (as high as 88.9%

accuracy) and people are saying that this might help diagnose gout more accurately than by using blood tests alone. [117] [118] [119] [120]

So this confirms that the microbiome looks different in gout patients and that the differences are predictable. Do these differences maybe help explain why gout might arise? It turns out that yes, these results may actually reveal one massive critical factor in gout onset and progression that explains why some people get gout and others don't - even when they have similar lifestyles.

Up until this point in the book, we have been saying that uric acid is removed from the body by the kidneys. But this isn't the whole story. In actual fact, the kidneys eliminate about 70% of the uric acid that might form in the body. The other 30% of uric acid that might be formed in the body is actually handled in the gut. More precisely, it is the presence of specific little bacteria that take a certain amount of purines from your food and directly convert them into uric acid. Then after converting to uric acid, the bacteria convert that uric acid into allantoin, which is then excreted. Bacteria can do this last step, but humans cannot – unless we have a healthy microbiome. [121] [122]

Ok, so what this means is that if our microbiome doesn't pull its weight by handling 30% of the body's uric acid load, then there will be increased demands placed on the kidneys to eliminate uric acid. In a way, if your microbiome drops the ball on uric acid excretion the kidney has to take up the slack. Unfortunately, the kidneys can only do so much heavy lifting. If we load our diet with foods that contribute to high uric acid levels, and we live a lifestyle that contributes to high uric acid levels, then the kidneys simply cannot keep up with the task without our microbiome doing 30% of the work too.

The kidneys and the microbiome have to work together to handle the uric acid load. Over time, without the microbiome's help, uric acid levels will rise in the blood to the point where it can't dissolve anymore. That is when it starts getting deposited in the joints and surrounding tissues. Eventually, one day, some crystals shed into the joint fluids and spaces and the immune system steps in to do a clean-up; causing inflammation, pain, and all the other symptoms linked with acute gout attacks.

These discoveries are really exciting for us because all we need to know is how to support the microbiome so that it continues to help the kidneys. This will definitely help gout patients reverse and prevent symptoms – especially in the longer term.

Which bacteria are linked to gout?

When scientists set out to answer this question, they noticed that not only were certain specific bacteria linked to gout but that those same bacteria were also linked to many other closely related disorders. We know from chapter one that gout and hyperuricemia are risk factors for many other disorders like kidney stones, obesity, diabetes and so on. We also know that many of the disorders that gout is a risk factor for are themselves also risk factors for gout. These interlinking risk factors between diseases came out of statistical studies on populations (so-called

epidemiological studies), so no description or explanation as to why these diseases would be linked together could be drawn from such studies. But now, with the discoveries made by microbiome researchers, we can finally show what might be linking these diseases together, rather than just making good guesses as to why.

It turns out that the microbiome situation in obese people, people with type-2 diabetes, people with certain kinds of arthritis, people with Irritable bowel disease, and people with certain metabolic disorders all share common characteristics at the level of the microbiome. [123] [124] The fact is that each one of these disorders is characterized by chronic inflammation and similar microbiome profiles. For example, the bacteria *Bacteroides caccae* has been linked to gout and IBD.[125] Other studies have shown that the gut bacteria of people with diabetes is also very similar to gout patients'.

So, people with these related disorders tend to have characteristic populations of bacteria that go a long way to explain their problems. For example, gout patients tend to have far less of a bacteria called *Faecalibacterium prausnitzii.* This particular bacteria is noted because it is important for producing chemicals that provide nutrition and protection for the gut lining. This little bacteria helps repair the gut when damaged, boosts healthy gut immune system functioning, and help keep different gut bacterial populations in a healthy balance. Overall, *Faecalibacterium prausnitzii* also has an anti-inflammatory action which is very beneficial for soothing and preventing gout.

The thing about *Faecalibacterium prausnitzii* is that the same findings have been reported in the gut microbiome's of people who are highly stressed and in people with type-2 diabetes. This means that there is a strong biological link between gout, type-2 diabetes, obesity, chronic stress, chronic inflammatory conditions, and many other disorders. [126] [127]

What should we conclude from this research? The facts above are really important for us if we have gout. They seem to imply the following very important things:

1. You have gout because your gut is not helping your kidneys.
    a. Your gut isn't helping because it has the wrong kinds of bacteria.
    b. The right kinds of bacteria are not being encouraged to flourish by lifestyle factors.
    c. The wrong kinds of bacteria are flourishing due to lifestyle factors.
    d. The kidneys can't handle the uric acid load alone (without the gut doing its proper part) because of lifestyle factors that overload the body with uric acid.
2. Your gout is linked to other disorders like type-2 diabetes, obesity, high blood pressure, and problems with your metabolism.
3. If we want to treat gout we should support our microbiome to handle 30% of our uric acid levels.

4. If we want to help gout, we can also draw upon treatments that help type-2 diabetes, high blood pressure, obesity, etc. The common factors are inflammation, food and drink choices, lifestyle, and microbiome balance.
5. If gout is related to these other disorders, then if we get gout it should be understood as a warning sign that you are likely well on your way to developing one or more of these serious disorders in the future – if nothing is changed. We can be grateful to our body for giving us this warning sign before things got worse, even though this warning sign is painful (gout attacks are really painful) at least we can't just ignore it.
6. We should understand that uric acid-lowering therapy will not be enough on its own to reverse or prevent gout. We need to include diet and lifestyle changes to repair the microbiome.
7. Short term treatment of gout attacks is different from long term treatment of gout. In the short term, we should try to help get through the pain and inflammation of a gout attack (see some of our amazing and powerful natural options to do this effectively elsewhere in the book). In the long term, the best way to proceed is to select our diet carefully based on knowing the kind of microbiome we want, along with understanding the powerful ability of natural compounds to help with specific gout factors. The main factors will be reducing stress, managing uric acid, decreasing inflammation.
8. The selection of a diet that is alkaline inducing keeps our blood sugar levels in awesome healthy ranges, busts inflammation, and helps keep uric acid levels low should be able to achieve the necessary conditions to heal from gout in the long run. (we will explore this topic in the final sections of the book).

Many of the points made above mention the links gout has to other disorders, particularly shown via microbiome similarities. It will be useful to consider how the microbiome affects weight loss and gain of weight precisely because of these links. Also, a small discussion of low-GI foods, probiotics, and prebiotics would be very useful for us in terms of understanding what we need to do to support the microbiome's health.

Looking at point "8." above we mention a diet that works for gout. In the final chapter of the book, we will talk about treating gout. In that section, we will recommend a diet with specific foods that take into account everything we know about gout, including the microbiome.

Gout & Chronic Inflammation

Chronic low-grade inflammation is a feature of just about every modern age-related degenerative lifestyle condition. Conditions such as diabetes, obesity, Alzheimer's disease, dementia, arthritis, some cancers, heart disease, and of course gout, are all linked to chronic forms of inflammation in some way or other.

In gout, inflammation can be acute or chronic. Acute inflammation in gout is the kind of inflammation that happens when you get a gout attack. Acute inflammation like this is short-lived, intense, painful, and debilitating. Acute inflammation in gout is responsible for the

redness, swelling, pain, heat, and loss of function that most people are familiar with in gout attacks.

These acute symptoms are usually so unpleasant that they are most likely the main reason why people go to the doctor and eventually get diagnosed with gout. So this kind of acute inflammation is treated symptomatically over the short term to manage the intense pain and discomfort experienced during attacks of gout.

If we remember back to chapter one of this book, we mentioned that gout is also linked to low-grade chronic inflammation in the periods of no symptoms between gout attacks (during 'intercritical' phases). Chronic low-grade inflammation is, in our opinion, one of the main mechanisms behind why our body degenerates over time because this kind of inflammation can actually cause low-grade damage to tissues all over the body. This damage itself can also trigger more inflammation, so once chronic states of inflammation set in, the process can gradually feed off itself escalating into ever more serious symptoms. We need to reduce (and prevent) chronic inflammation to help the body be in good health. Since gout has this kind of inflammation, it is important we attend to it.

The Inflammation Response

The inflammatory response is what our immune system does when it encounters toxins, damaged cells, or pathogenic viruses/bacteria. In such cases, the body will secrete special inflammation chemicals. These inflammation chemicals are called cytokines, and they act like little messengers that tell the cells of the immune system to jump into action and eliminate dangerous organisms whilst repairing damaged tissues.

The inflammatory response is the first response of the immune system to damaged tissues or pathogens. The response is started, organized, and regulated by the 'cytokines'. It is important to realize that the inflammatory response in healthy people is both normal and necessary. It is normal because it is just what the immune system does to protect us, and it is necessary because we need the immune system to respond in this way to repair tissues and protect against disease.

The problem with this system is that it comes at a price. Inflammation is a very energetic immune process that can also cause damage if it isn't controlled properly, or if it is constantly happening. For example, people who have rheumatoid arthritis suffer because their own immune system targets the soft tissues of their joints leading to joint destruction and inflammation. Rheumatoid arthritis is an 'auto-immune' disorder which means that their own immune system is damaging the body.

Rheumatoid arthritis is an extreme example of the power of the inflammatory immune response to damage our own tissues. In cases of chronic low-grade inflammation, like that seen in diabetics, or to a lesser extent in gout, the effects of the immune system on the body are not as dramatic as in rheumatoid arthritis. However, the fact that the inflammation is happening pretty much constantly at a low level means that there is some small scale damage being done every

day – it adds up, over years and years, to more serious problems. There are simple ways to help the body deal with chronic inflammation. One way is to eat food that doesn't contribute to any kind of inflammatory response. Another way is to eat foods that actively combat inflammation. On the other hand, we can unwittingly contribute to chronic inflammation in the body too by exposing ourselves to some common factors. Examples of the kinds of things that contribute to chronic inflammation include:

- Chronic Stress
- Poor sleep
- Sedentary lifestyles
- Certain Dietary Choices
- Chronic infections
- High sugar consumption/High-Gi Foods
- The presence of other disorders like diabetes, obesity, cancer, etc.

What we do on a day to day basis in terms of the foods we eat, the drinks we drink, the exercise we do, the stress we feel, the amount we sleep (and so on) all has effects on the natural systems of the body. If we constantly do things that induce low-grade inflammation in the body, then the body will constantly suffer the effects of such inflammation. The effects of such inflammation ultimately wear down the body and we see the results of such things as apparent aging and decline, digestive malfunction, microbiome disruption, immune suppression/vulnerability, depressed mood, and so on and on.

The fact that chronic inflammation is linked to bad outcomes in the microbiome, type-2 diabetes, obesity, high blood pressure, *and* gout should be enough of an indication that we need to be thinking about reducing it when we make a plan to heal from gout.

So what are the best ways of reducing chronic inflammation? Some of the best ways can include:

- Ingesting lots of healthy anti-oxidants
- Exercising
- Sleeping properly
- Managing stress
- Preventing chronically high blood sugar levels
- Keeping the microbiome in top shape.
- Eating a diet filled with foods and drinks that don't contribute to inflammation or that actively combat inflammation.

Avoiding chronic inflammation helps with our long term plan of total health, and serves to prevent future gout attacks. Reducing or limiting chronic low-grade inflammation will also protect the body from the damage such low-grade inflammation can gradually cause to our healthy tissues and cells. Helping with symptoms and reducing uric acid are the initial focus of a

good long term plan, but the ultimate goal would be to have a long term solution for chronic inflammation – a solution that should help remove and prevent gout.

If you remember back to section one where we discussed what gout was and showed all the risk factors, then you might remember us mentioning that high blood pressure, obesity, diabetes, kidney disease, and arthritis were all linked to gout in some way. Inflammation is an important factor that links these conditions together.

This means that our long term strategy for eradicating gout will likely benefit from some of the things that bring relief and benefit to people suffering from these other related disorders. This idea is strongly supported by our discussion of the microbiome in this section too since people with gout share striking microbiome similarities with diabetics, obese people, or people with IBD. In all three of these linked conditions managing blood sugar, weight gain, and managing inflammation will really help reduce and prevent inflammation as well as support the microbiome to reform itself so that it can start helping out with our uric acid.

This fact is really good news for us because we can draw from a much wider pool of good scientific research to find just the right anti-inflammatory strategies and tools to combat our gout and eliminate it in the long term.

A recent article published in Harvard Magazine[128] reported on how chronic inflammation was likely to be the root cause of many chronic diseases like heart disease, atherosclerosis and so on. They also published a fantastic table listing all the kinds of anti-inflammatory properties that some food types have, and their benefits for different diseases. Here is what they said:[129]

FOOD TYPE	BENEFITS WHAT DISORDERS	Contains	WHY?
Beef/Chicken/Eggs	Asthma, Colitis, Corneal disorders, Cystic Fibrosis, Eczema, Periodontitis, Neuro-inflammation	Arachidonic acid	Strong anti-inflammatories called “lipoxins” are generated because of arachidonic acid.
Algae & Cod-Liver Oil	Alzheimer’s Disease, Asthma, Atherosclerosis, Burns, Cancer, wound healing, kidney ischemia, pain, retina problems, sepsis, spinal cord injuries, stroke, neurodegenerative diseases, psoriasis, certain allergies, obesity, oral inflammation, Arthritis.	OMEGA-3 FATTY ACIDS e.g. (EPA) e.g. (DHA)	1.EPA Leads to the generation of “E-series resolvins” which are potent anti-inflammatories. 2. DHA Leads to the generation of “protectins”, “D-series resolvins”, and “Maresins”
FISH anchovies sardines mackerel, salmon	CONTAIN WHAT THE OTHER FOODS DO SO THEY HAVE ALL THE BENEFITS OF THE OTHERS		

Clearly, our choice of foods and the way they are prepared can radically affect our inflammation. Notice all the disorders listed. Each one is acknowledged to be linked to inflammation in the above table. Each one can be helped in some way by a natural food source containing omega-3 fatty acids, and each entry on the list must be linked in some way to another entry.

Choosing what we eat will also massively affect our microbiome too. So this kind of research really puts it simply - inflammation is super important! We will look at more foods, herbs, supplements, and other things for gout and inflammation in the next chapter.

In the remainder of this chapter, we will look at the microbiome in terms of weight gain, glucose control, probiotics, and prebiotics. These sections help us to round out our understanding of the microbiome and how to use it to combat gout and inflammation by controlling weight gain and healthy sugar metabolism.

Weight and the gut microbiome

We just reviewed what some of the latest research has found out about gut and the microbiome and in there we mentioned that gout, diabetes, and obesity seem related at the microbiome level. We also know from chapter one of this book that gout, obesity, and hyperuricemia are related in terms of risk factors to each other. On top of all these relationships is the fact that obesity is also a risk factor for diabetes and cardiovascular disorders. So it seems that this particular set of disorders is very tightly related.

There are only a few things that could account for these tight interrelationships. One link between all these disorders is likely to be the microbiome, and a second link is likely to be the presence of widespread low levels of chronic inflammation. Finally, just in case anyone was still doubting, the final relationship we should acknowledge is that the microbiome itself has a large impact on our immune systems, particularly with regard to inflammatory conditions within the body that result from diet and lifestyle choices.

Here we will look at how the microbiome and weight interact, particularly with regard to obesity and weight loss. This is very relevant for gout patients because obesity is related to hyperuricemia and gout - they are risk factors for each other. So, without further delay, let's take a quick look at what scientists have discovered about the gut microbiome and its ability to influence our weight.

The initial research into this area of the microbiome found that organisms in the gut of people with diabetes were very different compared to people who were healthy with healthy gut flora populations. Exploring further, scientists then discovered that slimmer people tended to have up to 90% more *Bacteroides* species of bacteria and 20% less of the *Firmicutes* species of bacteria than obese people. So diabetics had different gut profiles to healthy people, and slimmer people had different bacteria to more weighty people. As time progressed later studies kept repeating the same findings making it possible for the research scientists in this area of research to confidently

claim that the ration between these two bacteria in the gut was contributing in some way to being slim or overweight. In fact, a scientist could guess whether a gut sample was taken from a slim person or a weighty person without looking at the person.

So, people began to wonder about these little bacteria. What was special about each one, and why did the ratio between the bacteria matter so much?

One study showed that *Firmicutes* bacteria are able to extract calories from complex sugars in food that we eat…and then deposit them *directly into fat cells*. This action by *Firmicutes* bacteria in the gut causes an increase in fat deposits in our body. This is especially the case whenever our gut is disproportionately loaded with these kinds of bacteria compared to other bacteria. The *Firmicutes* bacteria are actually kept in check, or balance, by having high numbers of *Bacteroides* bacteria in the gut.

The bottom line is that our gut needs to maintain a healthy balance for us to have slim healthy bodies. The implication of the bottom line is that if we do things in our daily life that unbalance critter populations that live in our gut, then *major* changes can happen to us – like putting on a lot of extra weight. Remember, this is only one example, let's look at another one.

In 2013 a groundbreaking discovery showed how certain plant chemicals (called polyphenols) were able to regulate the ratio of these two bacteria in the gut directly. It was found that these polyphenolic compounds had almost exactly the same effects as prebiotics – they made *Bacteroides* species flourish. One great result of these little critters flourishing is improved weight loss; another is massively improved overall health status.[130]

Meanwhile, other studies done on overweight and obese children started showing how both *Bifidobacteria* and *Lactobacillus* bacteria were actually able to protect children from gaining weight. This protection happened in the children studied simply because of decreases in the numbers of gut bacteria associated with bad health effects. In fact, healthy children had *double the amount* of *Bifidobacteria* in their GIT compared to obese children (double!). Conclusions to these papers were usually strong and similarly stated – good to high levels of Bifidobacteria in the gut help protect kids from obesity. This is such good news, and easy enough to understand too. If you have the right gut bacteria in the right balance, then you don't gain as much weight and you lose excess weight more easily. You get protection from obesity. Remember, obesity is a serious risk factor for many other diseases, so protection from obesity is strong protection from diabetes, heart disease, cancer, metabolic disease, hyperuricemia, high blood pressure, and on and on.

We could go on all day about the amazing effects of the microbiome on our body weight, so let's keep going! Some of the other major findings included: [131]

- Taking high doses of special plant-based polyphenols (called proanthocyanidins) increased the number of *Bifidobacteria* in the gut – once again with the result of great weight management and overall health gains.
- These plant polyphenols are found abundantly in blueberries and grape seed extract. They are usually always in any kind of purple, blue, or dark red berries because they are the molecules that give those plants their color.
- Proanthocyanidins protect the heart and help prevent cardiovascular diseases.
- One superstar compound called Resveratrol is actually an extract of these pigments. Resveratrol helps us to regulate weight and extend our lifespan.
- Several studies have shown that when large doses of *Lactobacillus* bacteria were given to participants they were much less depressed. Many experienced healthy improvements in their mood.

Some plants contain special compounds called flavonoids. Flavonoids are also considered to be polyphenols. We will explore the massive benefits these flavonoids can have for us in the next chapter, but for now, we want to point out that flavonoids benefit our gut microbiota too. Turns out that plant flavonoids can help us to decrease the numbers of nasty *Clostridium* bacteria in our gut while also boosting beneficial *Bifidobacteria* species.

The results we have talked about here are only the tiniest fraction of what actually exists in the literature. The microbiome is powerful, and its state of health directly affects our health – its effect on weight management is a great example of this fact.

Active Steps to a Healthy Gut

We know the gut environment is important to our health and important to preventing and healing our gout. The gut microbiota has links to our weight, gout, and diabetic risks. So what can we do about it? Aside from lifestyle factors, we can make sure to get a lot of good probiotics and prebiotics daily.

Probiotics, what are they?

The World Health Organization (WHO) defines probiotics as organisms that provide health benefits to our body when consumed at appropriate doses.[132]

Probiotics aren't parasites, and they don't produce harmful effects. By definition, probiotics are only those organisms in our gut that we will use to support our health. Only those that we need in the right balance to help us to thrive.

We human beings probably evolved to work with probiotics, and they evolved to work with us – as a team. Think about it, the organism gets a food delivery service, a nice warm environment and everything it needs at a super convenience. So, those organisms that end up supporting their human hosts will get to have their homes for longer, with better quality food more often. The human body benefits from whatever the organisms give out. In many

cases, we get vitamins, minerals, and other things, whilst the little organisms get the stuff we can't use very well. It's symbiotic teamwork all the way with our beneficial microbiota – it is not a case of parasitism.[133]

Our microbiome is quite well developed by the time we are born - birth and breastfeeding contribute a lot of our unique gut flora. In fact, infants that are born through cesarean section have been shown to suffer much more from unbalanced populations of gut bacteria that can cause problems (called dysbiosis).

The same type of problem occurs when babies are unable to breastfeed, which causes gut dysbiosis and impacts negatively on these infant's immature immune systems. In fact, mothers who undergo c- section births in Europe are often given probiotics for the first 6 months for the mother and baby to ensure that the microbiome recovers from surgery and allows infants to thrive.

If we take even a single course of antibiotics then we destroy the gut microbiome. Studies have shown that it can take up to two full years for us to restore our gut ecology to healthy states after a course of antibiotics. In fact, we usually have to take specially prepared probiotics and nurture them with prebiotics before our gut ecology can return to normal after antibiotics – even then it can take up to 2 years.

We now know that until relatively recently the western medical system has overprescribed antibiotics **and unknowingly damaged billions of microbiomes globally. What many may not know is that even if we are not taking prescription antibiotics we still receive continuous antibiotic input due to modern western farming practices using antibiotics to grow commercial meat products.**

Sadly it is common for humans to ingest antibiotics every time we eat meat or animal products. Of course, this affects everyone's microbiome, not just animals but humans as well, and this also causes our immune systems to be depleted and unable to muster a robust response when we are invaded by nasty disease-causing organisms.

All of these practices have led to an increase in microbes that are resistant to almost all antibiotic treatments and humanity is now in danger of being unable to treat the infections that antibiotics were once able to control. This situation has increased scientific interest in the role that probiotics can play in our health because they renew our gut ecology and restore our immune system's ability to defend itself from dangerous infection and unnecessary forms of inflammation.[134]

Many studies have proven that taking probiotics inhibit the growth of resistant strains of bacteria. For example, *Lactobacillus plantarum* has is able to prevent infection and support quick healing in severe burn wounds. [135]

Another amazing example demonstrated by research is how *Lactobacillus reuteri* was able to protect tissue damage caused by the notorious *Staphylococcus aureus* bacteria.[136]

Recently scientists discovered a direct connection between immunity in the GIT and our skin, which is not surprising considering that our GIT is lined with skin (as are all our organs and blood vessels). This research concluded that oral probiotics are able to moderate our allergic responses in the gut and that this simultaneously improved allergic skin conditions.[137]

It begins to make sense when we read that multiple studies have discovered that probiotic supplementation treats dermatitis, decreases inflammation, enhances immune function and reduces levels of harmful bacteria. Probiotics products that included *Lactobacillus salivarius* and *Bifidobacterium breve were even reported to improve people's overall quality of life.*[138]

Compelling evidence from multiple studies has shown that many species of bacteria contribute to a broad spectrum of healing functions in our gut microbiome. These healing functions provide massive benefits to our entire body, bringing multiple areas and systems of the body into a harmonious balance.

What kinds of foods are beneficial 'probiotic' foods? The following are broad examples:

- Yogurt
- Kefir
- Sauerkraut
- Tempeh
- Kimchi
- Miso
- Kombucha

Considering that our microbiome is considered to be almost synonymous with our immune system status, it makes logical sense to include as many probiotic foods into our diet as we can. Perhaps even more important than probiotics is the need to supply the exact foods to our microbial community that helps probiotic organisms to flourish in our GIT.

Currently, many experts note that taking oral probiotic supplementation is not useful unless we also give these bacteria the appropriate food they need to get established initially. This means we need to take pre-biotics too in order to help our new bacteria to get going.

Prebiotics – What are they?

Prebiotics are quite simply the foods that beneficial gut bacteria need to eat in order to thrive. When we include prebiotics in our diet we are ensuring that beneficial organisms are fed the type of nutrition they need to perform valuable functions that are essential for us to have a healthy body and mind.[139]

Our diet is directly responsible for determining our microbiome and the type of bacteria that we host. If our diet is nutritious and filled with prebiotics then we will have a healthy gut ecology that promotes a strong immune function that promotes our own health. Of course, the opposite is also true because if we eat foods that feed pathogenic bacteria then our immune system is unable to function optimally and we land up having an unbalanced microbiome and health disorders. Over time this develops and we start experiencing chronic lifestyle diseases and age prematurely.

This understanding is relatively new and perhaps a bit revolutionary for our understanding of health. For example, it might even explain why people find it so hard to lose weight when they are obese, even if they really want to have a slim profile. Some scientists have suggested that the cravings for different foods may, in fact, be directly induced by the organisms that make up our microbiome. It may explain why some people find it so hard to stop eating all the foodstuffs that contribute to weight gain.

Compelling evidence accumulated through research over the last decade clearly shows that prebiotics affect our microbiota in a way that produces beneficial effects - decreasing our appetite and fat mass whilst improving our glucose tolerance. Even more exciting is their ability to directly alter specific hormones that dramatically reduces the risk of developing both diabetes and obesity.[140]

Prebiotics has also been proven to increase our body's ability to absorb minerals, especially calcium that is essential for keeping strong healthy bone tissue. A few studies have discovered that prebiotics increase our ability to absorb iron and magnesium that are critical for providing the support our red blood cells need to function optimally.

Research into prebiotics is still in its infancy and only began to attract international attention in 1995 after a group of Japanese scientists produced research that highlighted some of the beneficial effects of eating regular prebiotic foods. As more studies are conducted we expect to gain a deeper understanding of the specific mechanisms that prebiotics use in regulating the microbiome.

To date, scientists have identified two basic prebiotic groups that give the right kinds of food to our gut flora. Both of these groups contain long complicated sugar molecules that humans can't digest – but the gut flora can. When these gut bacteria eat and break down these un-digestible sugars they start producing chemicals as by-products – these chemical byproducts help to directly regulate our immune system making it more responsive and effective.

The little microbes also release nutrition for our body to absorb and enhance our ability to digest food by increasing our ability to absorb food. Naturally, this also aids us in keeping our bowels regular and supports the elimination of toxic waste products. The net effect is that we can regulate our weight, increase our energy, have a happy immune system, and live a life of abundant health.[141]

The two main prebiotic groups along with foods that contain them are listed below:

Prebiotic group 1: fructo-oligosaccharide (FOS)

- Chicory root
- Onions
- Jerusalem artichoke
- Garlic
- Leeks
- Bananas
- Wheat
- Barley

Prebiotic group 2: Galactooligosaccharides (GOS)

GOS is a wonderful food source for the healthy species of lactobacilli and bifidobacteria in particular.

GOS rich foods include:

- Green peas
- Hummus – made from chickpeas
- Kidney beans
- Lentils, and Lima beans.

Just a handful of these foods daily included in your diet will optimize your health and keep your microbiota in an optimal state.[142]

So, to recap:

- We can optimize our microbiome by increasing levels of beneficial bacteria through a prebiotic diet
- A healthy microbiome ensures efficient fat metabolism that reduces obesity
- A healthy gut and microbiome will be able to eliminate up to 30% of our diet linked uric acid levels. People with gout and hyperuricemia don't have the right gut ecology to eliminate 30% so they are left with hyperuricemia over time and risk gout attacks.
- Beneficial gut bacteria stabilize blood sugar levels and decrease unhealthy food cravings
- A balanced microbiome helps us to regulate blood sugar properly. Since excessive blood sugar is linked to more uric acid, and diabetes, obesity, and other problems. A balanced microbiome is really important to all of these conditions.
- Beneficial gut bacteria cause a reduction in gut inflammation that is considered to be a major risk factor contributing to diabetes - additionally symptoms of bloating and pain can be dramatically decreased
- Prebiotic diets aimed at increasing healthy levels of beneficial gut bacteria decrease depression and anxiety, improve positive mood states and energy

It turns out that we really are what we eat and all we really needed to know for our health is summarized below:

- Our microbiome and the probiotics that regulate our gut ecology
- What prebiotic foods we need to eat to increase beneficial bacteria that help to bring our bodies into balance.
- Plant polyphenols and their amazing medicinal properties are found in easy to access, nutritious, and enjoyable superfoods
- What we need to avoid if we want to reduce levels of harmful gut organisms

Eating Low Glycemic Index Foods

The glycemic index (GI) is a table providing an index of values assigned to different foods that contain sugars or carbohydrates. It was designed to help people understand how different foods affect our blood sugar levels after eating. The idea behind the GI index is to allow people to select foods that have less ability to cause high blood sugar surges so that they can have a tool to assist them in managing their blood sugar levels.

Each food entry is assigned a value that indicates the food's effect on blood sugar levels when compared to glucose, which has a set value that equals 100 units. The higher the value the greater the effect the food has on spiking our blood sugar. Of course, a lower value would indicate a lower blood sugar response after that item has been eaten.

We have included a glycemic index in an appendix 2 at the end of this book for easy reference.[143]

Just bear in mind that if you are out shopping and you see references to 'low-GI' on some product's packaging you can understand that this version of the product lies lower on the glycemic index table than usual for products of its kind – not necessarily that the product actually has a low value on the glycemic index.

Super Foods for a healthy microbiome!

Prebiotic superfoods help you to metabolize food properly and regulate weight easily and naturally. This means that you are able to convert more food into energy instead of fat. This starts a happy cycle because you start to feel better about your self and this self-fulfilling cycle is a positive one that renews your energy, improves your immune system, gives radiant skin[144] and remarkably returns health to you.[145]

Once the healthy bacteria are thriving then they regulate the messages received by your brain and you start craving healthy foods that are pro-life!

Healthy Foods List:[146]

- Kale
- Spinach
- Turmeric
- Curcumin
- Broccoli
- Eggs
- Dark Grapes
- Dark berries like blueberries, strawberries, cranberries, and mulberries
- Cocoa and dark chocolate - 70% Cocoa or higher.
- High fiber foods such as mangos

Altering our microbiome is really important, as can be seen by a study that made the following statement:

"*Altering our microbiota offers a tractable approach to otherwise intractable problems of obesity and unhealthy eating*."[147]

Probiotics are good bacteria and prebiotics are the food needed by probiotics to continue to live in your gut. If you just take probiotic supplements then they will leave the body if they aren't given the prebiotic foods they need to eat to survive.

Prebiotics can stimulate the growth of beneficial organisms especially Bifidobacteria and levels can even increase within 7 days of introducing a rich source of prebiotics into your daily diet.

Prebiotics are resistant to heat, oxygen, and strong stomach acids – they can get to the part of the GIT where they are needed to ensure that healthy colonies of beneficial bacteria can grow and thrive.[148]

The most important healthy microbes that reside in our bodies are Bifidobacteria because they specifically target immune functions in a way that increases resistance to diseases and protects from infection in general. They improve our body's immune system to be alert and able to respond to quickly to deal with invading pathogens whilst also making sure the immune system is regulated properly avoiding unnecessary inflammation.[149]

They were also shown to decrease markers that typically show chronic gut problems and even enhance overall gut health.[150]

The microbiome research has been supported by other research that determined that most people who suffer from Irritable Bowel Syndrome (IBS) also have significantly lower numbers of Bifidobacteria in their gut.[151]

To be really clear you need to know that after a decade of multiple studies we now know that different microbes eat different foods. We also know that harmful microbes are anti-life and perform different functions to beneficial bacteria that are pro-life.[152] If we eat the types of food that harmful microbes can't eat but are exactly what the beneficial organisms need to thrive then we will restore homeostasis to our gut-brain microbiome and find ourselves in a position of optimal health.[153]

Real health benefits Include:

- Strong, responsive, and well-regulated immune functioning
- More energy
- Fewer food cravings
- Smoother digestion
- Weight management
- More energy that leads to more physical activity
- Massive reductions in risk for just about every chronic lifestyle disease.

Use natural non-GMO products, Free from additives, gluten, artificial sweeteners, lactose, and rice maltodextrin if possible.

Why Plant Lectins Are Important[154]

Eating foods high in plant lectins can disrupt the microbiome and cause chaos when eaten by some people. Lectins are chemicals made by plants to protect their seeds and fruits from being eaten or invaded by other species, like fungi. This is a healthy protective plant mechanism designed to ensure its survival but when eaten in high doses, lectins can be very toxic for humans, animals, bugs, and insects. In one report crickets died immediately after having lectins.

Lectins are proteins that bind to sugars (carbohydrates) and are found concentrated in seeds and tubers such as cereal crops, potatoes, and beans (legumes), whole grains, peanuts, kidney beans, nightshade vegetables (like potatoes and tomatoes) and some seafood.

Research has been growing over the last 50 years indicating that lectins may affect more people than realized and that many people may not be able to tolerate dietary lectins.

Several studies have linked lectins to the following conditions:

- Obesity
- Diabetes Type1 and Type 2
- Insulin sensitivity
- Food allergies
- Inflammation
- Autoimmune disease
- Celiac disease

- Low energy levels
- Kidney disease

High lectin foods have been shown to provoke inflammation-causing gastro-intestinal problems. These sticky molecules can attach to our gut lining and prevent our gut cells from being functional – lectins can literally degrade our gut lining and cause unpleasant problems like leaky gut syndrome. [155]

Considering the role that the microbiome and inflammation play in gout attacks, it is worthwhile limiting high lectin foods from your diet, especially when you notice that lectin foods are generally extremely acidic too.

Plant Lectins to Avoid

Deadly Nightshade Family

This is a notorious group of foods renowned for causing gut issues. The deadly nightshade family includes eggplants (aubergines), potatoes and peppers that contain high quantities of lectins that also accumulate in the skin and seeds. This family of foods is notorious for penetrating the gut wall and causing "leaky gut syndrome" or increased bowel permeability. This gut inflammation allows foreign proteins to be absorbed into the bloodstream causing health problems that accumulate over time.

The main offenders to avoid:

- Eggplants
- Potatoes – skins, leaves, and stems
- Chili Peppers
- Tomatoes – in seeds and outer skin

Beans (Legumes)

Most beans are very high in lectins too. It is surprising to discover that nearly 20% of all food poisoning cases come from eating undercooked beans. Sprouted beans are considered non-toxic.

Note: Many beans have been found to be a rich source of purines too and acidify the body making them unsuitable in an anti-gout diet.

Cashews

Did you know that Cashew nuts are actually beans (legumes) that contain very high amounts of lectins? Tree nuts are generally healthy although tending to be slightly acidic. They are usually a good source of nutrients when added in moderation to a balanced diet.

Peanuts

Avoiding peanuts is a good strategy. Not only are they rich sources of lectins but in many people, they cause allergic responses. We are not talking about allergies that are life-threatening

causing systemic shock. Instead, peanuts can provoke an immune system response that typically causes inflammation chemicals to be released. Naturally, this increased toxic burden is not desirable for a gout-free body.

Researchers have reported that up to 94% of the global population makes antibodies to peanut lectins. All that this means is that most people cannot tolerate these ground nuts.

Our advice is to avoid peanuts and peanut butter and replace these with occasionally eating healthy tree nuts such as pistachios, macadamias, almonds and especially walnuts.

Grains

There have been many anecdotal stories where gout patients have removed grains from their diets and had wonderful results. Research on this topic was harder to find but we were not surprised to discover that grains are both acidic and have high lectin content too. This makes them unwelcome in an anti-gout life.

Wheat lectins have been implicated in kidney disease[156] and when eliminated from the diet showed a significant reduction in the amount of protein found in the urine of those tested. So this seems to be a very clear indicator that grain lectins would not be great for gout.

As regards to bread, the best kind of bread would be the loaf you make from scratch at home using non-genetically modified flour that is free from additives. Since commercially prepared bread often uses overly refined flour that can contain tons of unnecessary additives – a factor that you can personally control if you are careful to purchase the ingredients yourself and do the cooking at home. In general, white bread needs to be used very sparingly because it is quite high on the glycemic index and can lead to cravings for more bread - In a way, you could say that white bread is addictive. If you have gout, then you are at risk for obesity and diabetes, and white bread can contribute to the health problems seen in these disorders. Better to support the little critters in the gut properly without introducing high GI wheat lectins that could severely interfere with your gut ecology. White bread tends to spike blood sugar levels and has too little fiber overall to be of much benefit – not really recommended at all.

At the beginning of the 21st century until even today there has been a lot of hype around not eating gluten because of gluten intolerance. When people cut gluten from their diet they do experience positive benefits, however, the scientific literature has found that only one percent of the population is actually intolerant to gluten – so this is a puzzling state of affairs.

These days, many experts think that the benefits gained from cutting gluten from the diet might arise more from the removal of toxic lectins than the removal from gluten. This could explain the benefits of removing grain glutens from the diet even with low rates of gluten intolerance. It might turn out that the reported increase in health status and energy levels of people following a gluten-free diet has absolutely nothing to do with gluten at all, but rather much more to do with the benefits they are receiving by simply decreasing the number of grain lectins ingested.

Of course, until the link between lectins, gluten, and improvements in health are clearly described, we can't be sure what the actual explanation is likely to be. Still, we would like to encourage our gout readers to reduce their grain intake (including products containing grain-lectins) in order to reap the benefits of a low lectin diet. The science that does exist on lectins that has emerged so far is compelling and persuasive.

Curbing cravings for sweets, fast foods, and carbs …

Cravings actually begin in the stomach and intestines because that is where we have 9 or 10 microbes for each human cell. Many of these microbes thrive in an environment that is supported by the very foods you crave.

In fact, the human microbiome project[157] estimated that we are premiere hosts for up to 25 trillion microbes. Whilst these generally help us to digest the food we eat, if the unhelpful pathological microbes outnumber the positive microbes, then we will experience food cravings. These cravings will lead us to eat the things that these negative critters want most to thrive. The opposite is true too. If we have an abundance of awesome beneficial microbes, then they help us to 'crave' the things they need to survive. When the microbes associated with poor health conditions predominate, then sadly we tend to crave and eat foods that contribute to weight gain, inflammation, hormonal imbalances, and high blood sugar levels.[158]

If you find it hard to believe that microbes in your gut are influencing your behavior and health status, consider that C-Section babies are sicker within the first 6 months than babies born naturally precisely because they don't have the benefit of critically important microbes to help fight off diseases.[159] Nasty microbes also require nutrients to survive and thrive, if they eat large amounts of what they need, then we might have shortages in those very things, causing us to crave foods high in those selfsame nutrients.

The 'gut', or 'GIT' (gastrointestinal tract) refers to the stomach, large and small intestines, and the colon – in fact technically the GIT starts in the throat and continues all the way down to your anus. The point is that microbes found anywhere along this route send messages to your body, including the brain, by using your hormones as a transport system. The brain will respond to these signals, it is informed as to your gut status because of these signals.[160]

In fact, 'nasty microbes' can include specific bacteria, yeasts, mold, and fungi. One classic fungus that many people have heard of is candida. Candida can proliferate to excessive proportions whenever your microbiome is unbalanced – i.e. missing too many healthy gut microbes. These bad microbes also network with your brain by hijacking your vagus nerve, which is the nerve that communicates directly between you GIT and your brain.[161] They send messages to the brain about the types of food they want you to eat.

How does our gut population become unbalanced? If you currently have a healthy gut microbiome, then it's easy to unbalance it – just take antibiotics, or eat artificial sweeteners or excessive amounts of sugar, or drink excessive amounts of alcohol. Antibiotics and sweeteners

are particularly bad, a single course of antibiotics can kill the entire microbiota of your gut, both good and bad bacteria.[162] Even if you have not ever taken prescription antibiotics, you will have received them if you eat meat as part of your regular diet. This is because recent research has shown that the antibiotics given to farm animals for commercial rearing are also passed on when eaten by humans, or other animals.[163] So when you are eating meat that is not free-range, then you are usually at risk of destroying your healthy gut population as well as harmful microbes. But that leaves the gut wide open for recolonization by whatever comes along. This is how people can end up with defunct microbiomes.

Another factor that has been found to negatively impact our gut ecology is artificial sweeteners. One study conducted by Duke University showed that a single sachet of Splenda (a brand of artificial sweetener) destroyed half (50%) of the microbes in peoples gut.[164] This is a very strong result which gives us a good reason to avoid artificial sweeteners.

We should try to reduce our dietary sugar to help with gout, but we can't turn to artificial sweeteners to make our foods and drinks sweet since that nukes the microbiome. One alternative to sweeten foods and drinks that won't negatively affect our health is stevia root powder which is a healthy replacement for table sugar and artificial non-nutritive sweeteners.

In order to curb cravings for foods and drinks that cause damage to our body and microbiome we need to cultivate the 'good guys'. If we have good populations of health-promoting gut bacteria, then they will naturally help to prevent the proliferation of unhealthy populations of micro-organisms. The research we have shown in Part 3 has already shown how critical it is for the microbiome to be healthy because it is responsible for managing weight gain so now you can see that taking artificial sweeteners are not only unhealthy for you but will also cause you to actually increase weight by destroying your gut integrity.

Another cool way to reduce the negative microbiome effects of cravings is to satisfy your cravings with healthy treats. This way we get to satisfy our desire for sweet things, or unhealthy things by using healthy substitutes that are really tasty too. Here are some healthy treats that have some benefits and fewer harms than traditional sweet treats do.

Healthy Treats

1. Cocoa Powder and Dark Chocolate - 70 % and above

We know sugar is rough for our health, and we know we should reduce it, but if you are craving some chocolate, then the least offensive option is to eat no more than 40g of very pure dark chocolate that is of very high quality. Dark chocolate contains things that promote health like resveratrol – which is a potent antioxidant. But, the chocolate should be of the highest quality you can find to reduce additives and no more than 40g should be consumed on any given day. Sugar is sugar after all.

In winter we can also recommend combining a good cocoa powder (without additives or preservatives) with whey protein powder to make warm winter drinks that keep the cold away and provides healthy nutrition whilst tasting delicious at the same time! Benefits of cocoa or dark chocolate polyphenols are listed below:

- Restores arterial flexibility
- Prevent white blood cells from adhering to the walls of blood vessels
- Decrease LDL
- Increase HDL
- Help reduce weight
- Delays premature aging due to high resveratrol content

2. Coffee without sugar and dairy products

Consuming coffee in moderation is fine until you are able to slowly reduce your dependence on this powerful beverage. Remember that coffee is addictive, so you need to wean yourself off this ancient plant slowly. Once you have completely detoxified your system of coffee then you can have a cup now and again, and really experience its benefits, such as enhanced focus and increased physical stamina.

Taking this stimulant beverage on a daily basis eventually contributes to a decline in energy and robs your body of essential nutrients due to the phytates present in the coffee beans. If you drink coffee daily over a long period of time it can even cause anemia.

In Part Three we discovered that coffee has potent beneficial effects that help to maintain balanced blood sugar levels, so initially, you may want to continue drinking it. However, once your blood sugar levels are under control then it is important to slowly reduce your intake and then use it wisely – it is, after all, an ancient wisdom plant and we only benefit when we treat it with respect!

- If you feel dependent on a sweetener then replace sugar with stevia
- If you have to add some milk then use hemp milk or coconut milk

3. Extra Virgin Olive Oil and Coconut Oil

Saturated fatty acids that are found in most commercial stores are extremely unhealthy for our body. This is one area where being diligent about avoiding cooking oils that are hydrogenated is essential for your well-being. It makes no difference whether the fats are derived from plant or animal products. Commercial processes destroy all the benefits and instead increase harmful byproducts in the oils. Generally, we want to increase omega 3 fatty acids and reduce omega 6 fatty acids with the exception of gamma linoleic acid (GLA) which is considered a healthy form of omega 6. The point here is that we actually need plenty of fats in our diet but only healthy fats!

Olive oil is one of the healthiest fats you can use. It has marvelous medicinal properties and can be considered an absolute treat by your body. It contains two potent anti-inflammatories – "oleic acid", and "oleocanthal". These anti-inflammatory compounds can help with reducing low-grade chronic inflammation which is super helpful for gout. The oils in olive oil are great for managing obesity and minimizing the risks for diabetes too.

Olive oil is not a saturated fatty-oil, unlike most common cooking oils it does not contribute to inflammation. It has been extensively studied, boasts an impressive variety of healing effects, and tastes utterly delicious when preparing Mediterranean food. Make sure that when you buy olive oil that it is cold-pressed and 'extra virgin' because any oils that are processed with temperatures above 39 degrees centigrade will cause all the medicinal constituents to be denatured – reducing its potent anti-inflammatory potential in the process.

Coconut oil is fantastic cooking oil that can be recommended wholeheartedly instead of common cooking oils like canola, or sunflower seed oil. Coconut oil is also reported to have wonderful health benefits and can be used to replace butter or harmful margarine in our diets. It can be used in baking, or as a skin cream to keep moisture within the skin.

4. All Berries and Cherries

By now and especially by the end of chapter four we will know all about cherries for gout. In fact, most berries and cherries are really good for general health. Studies have been done that show the benefits of eating berries on the gut microbiome. They taste delicious, and they are beneficial to the gut microbiome, so we can use them as healthy treats. A study showed that Just eating a ¾cup portion of strawberries daily boosted multiple health factors, e.g.:[165]

- Prevented spleen enlargement and colon shortening
- Moderated harmful effects in colon cells that were previously inflamed
- Decreased inflammatory immune cells in the colon
- Suppressed overproduction of abnormal inflammatory chemicals (called cytokines), such as TNF-α, IL-1β, and IFN-γ in the colon.
- Reversed unhealthy microbiota composition in subjects with Irritable bowel Syndrome.
- Increased populations of *Lactobacillus* and *Bifidobacterium* – really good microbes for gout health.

In addition to the benefits of cherries for gout that we describe in chapter three, tart cherries have also been shown to have dramatically beneficial gut microbiome effects when eaten regularly. For example, a study showed that eating tart cherries improved heart health, reduced the time taken by people to recover after exercise, and improved sleep.[166] A researcher on one study was quoted to have said, "[compounds in cherries] *positively shape the gut microbiome, which could have far-reaching health implications*." In response to the results of his own research that revealed that the combined mix of polyphenols found in tart cherries, such as flavonoids,

proanthocyanidins, and chlorogenic acids, combined together to boost health and improve the microbiome radically. [167]

So, one way to minimize the damaging impact of sweet treats on our health is to treat ourselves with healthy things. If those treats also actually prevent gout symptoms and lower our risks for other problems, then that is a massive win. Besides, dark chocolate of the absolute highest quality, strawberries, and cherries! Who would say no to these things?

Chapter 3

Natural Chemical Tools to Combat Gout & Bust Inflammation

Busting Inflammation, Supporting Microbiome, Decreasing Uric Acid

As we now know and understand from our discussion in chapter two of this book, chronic inflammation and microbiome health are very important for gout. In this section, we will explore fantastic natural sources of powerful anti-inflammatory compounds to combat gout. We'll also look at natural sources that really help to improve uric acid levels as well as substances with proven efficacy for any other relevant factor pertaining to gout.

Just to state the main point one more time, even though people consider uric acid and hyperuricemia to be the main factor for gout, this does not explain why a person's body went on to develop hyperuricemia in the first place. Again, kidney insufficiency or liver build-up, or other factors are not enough of an explanation for hyperuricemia and gout. We need to see hyperuricemia as a symptom of deeper things.

We also need to see that kidney insufficiency doesn't just come out of nowhere, it must happen as a gradual process of decline that is linked to pressure from chronic low-grade day to day inflammation, along with increased working demands placed on the kidneys by a defunct microbiome. This is where this book goes a bit further than a conventional view on gout because we address the causes behind the causes of hyperuricemia and then suggest options to help mitigate those deeper factors. What we are not doing is simply try to force the kidneys and liver to moderate uric acid. Instead, we want to try to reverse whole-body systems that may have become unbalanced that led to the hyperuricemia and kidney insufficiency in the first place.

In the long term, the body will repair the kidneys and restore uric acid levels and heal gout on its own provided that we support and repair the defunct systems that led to inflammation, hyperuricemia and ultimately gout. The earlier, initial phases of a good long-term treatment plan would need to manage uric acid levels directly as well as relieve pain, and help with the unpleasant symptoms of gout. But, as time and the treatment plan progresses we would like to do away with directly lowering uric acid levels and needing to take medications or supplements. In the end, it would be amazing if people could manage and prevent gout by simply living their normal daily lives and this is what we will ultimately aim for by the end of the book.

To be very clear, it is of no real use to force the liver to make less uric acid! Nor is it of any real use to force the kidneys to excrete more uric acid. Doing these things will only help in the short term to avert gout symptoms, it will do nothing to really address the true causes or reasons behind why uric acid was getting too high, or why your kidneys couldn't remove enough uric acid, or why the liver was making too much.

Daily inflammation-busting nutrients is probably the best way to affect the long term health of the body positively, so, If we are savvy, aware and knowledgeable of the finer details, we can adjust our nutrient intake to emphasize the things that support our basic health whilst also bring back into balance the things that are out of balance with respect to the deepest causes of gout.

There are many nutrients that we will describe in this section that combat gout, support the microbiome, or work at limiting inflammation and supporting the health of the body in general. But, the main superstar nutrients that combat gout from the literature that are worth a special mention include:

- Curcumin [168] [169]
- Omega-3 fatty acids[170] [171]
- Resveratrol [172]
- EPA (omega-3) and GLA (an omega-6, the 'only' healthy one) enriched diets.[173]

So in this section, we will explore the five nutrients mentioned above along with many other amazing substances that help with gout, microbiome, and inflammation so that later on we can try to emphasize foods and drinks that contain lots of these nutrients and compounds. This would be a winning strategy for complete gout free lifestyle over the longer term.

Supplements for Acute Attacks – Great Tips*

The following supplement suggestions are vital for an acute gout attack. We recommend that you take these for at least 3 months following your flare-up.

- Vitamin C powder (Buffered) Dose: 2 grams taken 3 times daily

Note: If you experience diarrhea then reduce the dosage by half

- Resveratrol Dose: Follow upper limit of manufacturers dosing guideline
- Omega-3 Rich Fish Oil Dose: Follow manufacturers guide
- Mega potent Vitamin B Dose: Follow manufacturers guide
- Melatonin Dose: 9 – 20 mg for the first week Afterwards reduce down until you are no longer taking it. Best taken 5 nights weekly half an hour before bedtime
- Zinc Picolinate Dose: 1 tablet (22 mg) after breakfast
- Curcumin Dose: Follow manufacturers guide

*(Check out Appendix 6 for other amazing tips to handle acute gout attacks)

Specific Power Nutrients, Foods, Drinks, & Vitamins That Fight Gout

Vitamin C

Vitamin C must be eaten or drunk in the diet – we cannot synthesize it with chemical reactions native to our body. Thus we should make sure to get enough of it by either supplementing with it or ensuring that we include good sources of vitamin C in our diet. Vitamin C is a potent antioxidant and the benefits it has for gout patients are very impressive indeed. We list some of the main scientific findings below:

- In lab tests, vitamin C lowered uric acid by inhibiting the enzyme in the liver responsible for producing uric acid (xanthine oxidase).[174]
- A review of 13 randomized controlled trials on vitamin C supplementation showed that adults with normal kidney function who took just 500mg per day for 30 days had significantly lower uric acid levels in their blood (0.35mg per liter of blood less, on average).[175]
- One study on no less than 184 healthy people showed that vitamin C supplementation increased the rate at which kidneys filtered the blood compared to people who did not take vitamin C supplements in the study.[176] This result is an excellent indicator of vitamin C's ability to help reduce uric acid levels in the blood by increasing the efficiency of the kidneys' filtration systems – it may, therefore, help to prevent gout attacks.
- Blood levels of vitamin C are inversely linked to blood pressure. In other words, the more vitamin C in the blood, the lower the readings for blood pressure are likely to be. This is significant for gout patients since hypertension (high blood pressure) is an independent risk factor for gout. [177] [178]

The findings above are specifically relevant to gout patients and are not exhaustive of the findings in the literature. This means that the above benefits are in addition to all the other well-known health benefits of vitamin C. Some of the other benefits of vitamin C can include:

Vitamin C is good for diabetics, the heart, and the blood vessels

- Vitamin C in combination with vitamin E has shown to reduce atherosclerosis progression after a heart transplant.[179]
- Vitamin C helps improve vasodilation and vastly improves coronary heart disease symptoms as well as diabetes.[180] [181]

Vitamin C has benefits in some cancer patients

- Vitamin C has proven to reduce ovarian cancer, preventing its growth and spread. When vitamin C is taken in our diet with a combination of carotenoids and gamma-tocopherol (vitamin E), it has shown to aid in the prevention of pancreatic cancer.[182]
- Vitamin C has been correlated to protecting against breast cancer[183] , lung cancer[184] , prostatic cancer[185] , and thyroid cancer Curcumin (See entry on curcumin further on in this section) actually enhances the antioxidant effects of vitamin C & E in this regard.

Vitamins E and C together prevent DNA damage which protects against many cancers.[186]

Other Effects of Vitamin C

- Vitamin C works with Vitamin E to protect the immune function. Vitamin C ensures that Vitamin E does not get used up by ensuring it can regenerate itself.[187]
- Vitamin C also aids in the absorption of nutrients[188], enhancing the immune system by allowing the body to build up a reserve of nutrients. A diet lacking in vitamin C results in scurvy or a severely compromised immune system[189].
- Vitamin C especially is needed for protecting our lungs[190] and is essential for smokers, individuals with respiratory problems or allergies and asthma patients. Vitamin C was shown to protect lungs effectively against oxidative stress.[191]

Well, you get the idea. We could keep on listing the benefits of vitamin C for pages and pages on end, but we feel that the case for taking vitamin C is strongly supported. We should make sure to supplement with vitamin C in the beginning phases of our plan, gradually shifting to relying on good amounts of daily vitamin C in our diet with only the occasional supplementation. The benefits of vitamin C for health should not be missed, by anyone.

Cherries

Way back in the 1950s, a small set of clinical cases documented the benefits of cherries for gout patients. By now, cherries have been considered a 'traditional' gout treatment and have seen quite common use in natural and alternative therapies for gout.[192]

Cherries are extremely rich sources of a powerful family of antioxidants called "polyphenols". It is these polyphenol antioxidants which are thought to explain the beneficial health effects of cherries, particularly for gout. [193] [194] Of course, relatively more recent studies have shown that cherries do indeed have some potential for helping gout patients. For example, one study published in 2003 showed that after a single dose of cherries (280g) the levels of urate in the blood of the participants dropped by 14% after 5 hours, whilst urate levels in the urine increased. In addition to this result, the people who participated also had fewer blood markers for inflammation (chemicals known to indicate the presence of inflammation).[195]

Unfortunately, not all the research into cherries tells the same story. For example, another study found that when they gave gout patients 15ml of a cherry juice concentrate daily for 4-6 months they didn't get any reductions in their blood uric acid levels. The people in this study who took the concentrate did have less inflammation and a massive 50% reduction in gout attacks.[196]

Cherished Cherry Smoothie for Intense Pain Management

Ingredients

- 227 g Red Cherries – wash and remove inner pips
- 1 cup Jasmine Herbal Tea

NB: At the start of an acute Gout Flare-up you may benefit by adding

- 1 Teaspoon Apple Cider Vinegar
- ½ Pineapple – outer skin removed and sliced for the blender (optional)

Method

- Place the following ingredients into a blender
- Blend together and drink half immediately and the balance within 4 – 6 hours
- Repeat daily for up to 3 months to balance uric acid balance

Notes:

1. Tart dark cherries are the best but all have potent benefits for gout.
2. Cherries act as powerful natural painkillers because they block COX 1 & 2 pain pathways. They also contain strong Xanthine Oxidase inhibitors, medicinal molecules that help reduce uric acid production in an acute gout attack. Refer to Chapter ??? for all the details.
3. Jasmine tea (Blocks pain pathways) and Green tea (xanthine oxidase inhibitor, relaxing, potent polyphenols) both have profound pain-relieving effects.
4. Pineapples contain a digestive enzyme (Bromelein) that reduces uric acid levels in gout.

The above result is fascinating in the sense that although cherries reduce the risk of gout attacks, and decrease inflammation, they don't seem to reduce uric acid levels. Perhaps the method by which gout is prevented is something completely different from uric acid concentrations. Indeed our main point is that it is inflammation and immune balance that plays a critical role in preventing gout.

Pineapples & Papaya

Pineapples contain huge amounts of antioxidants and digestive enzymes that can help support good nutrition and microbiome health. For gout, specifically, pineapple contains a fantastic compound called bromelain which has potent antioxidant effects that ease pain and inflammation for gout.[197]

Papaya has amazing anti-inflammatory properties for arthritis and gout. It contains a compound called papain which has been shown to reduce pain and inflammation as well as lower uric acid levels by inhibiting xanthine oxidase in the liver.[198]

The best way to enjoy these benefits is to increase consumption of these fruits within the context of a specially tailored anti-gout diet plan. Please see chapter 5 for a discussion of the recommended options.

Coffee

Americans love coffee. According to the stats, more than half of all Americans drink coffee, and if they do drink coffee then they drink 2 cups per person per day *on average.*[199] So, many will be happy to hear that there are significant benefits to coffee ingestion for people with gout.

Why would coffee benefit gout patients? Coffee is packed full of polyphenol antioxidants and caffeine which both seem to have a role to play in reducing the risk of gout attacks. Two very large studies were conducted that shed light on the role coffee might play for gout. The first study we'll look at was done by tracking no less than 89,433 women over a 26 year period – tracking their consumption of coffee. The conclusions were simple and clear, those women who drank more coffee had a significantly lower risk for gout. More fine-grained observations on the data included the fact that the largest reductions in risk (a staggering 63% reduction) were in women who drank more than four cups of caffeinated coffee per day, decaffeinated coffee was shown to reduce gout risk by as much as 23% - tea, unfortunately, had absolutely no effect on gout risk.[200] A second, similar study, tracked more than 45,000 male participants with similar results regarding coffee consumption – recording a staggering 40% reduction in risk for gout.[201]

So, what is going on with coffee and gout? Most people today think that the benefits of coffee for gout come from its caffeine content. It turns out that caffeine is a potent inhibitor of xanthine oxidase, the enzyme in the liver that is responsible for producing uric acid.[202] But, considering that even decaffeinated coffee was shown to be beneficial, and considering that cherries were also of benefit but not because they lower uric acid levels we should be looking for a deeper explanation than just caffeine. There is no consensus as to the mechanism that makes decaf coffee good at reducing gout risks, but some have speculated that it might be because coffee contains chlorogenic acids. These chlorogenic acids reduce iron absorption the effect of which would reduce gout risks.[203]

Whatever the reason might be for the tremendous power of coffee to reduce gout risks, one thing is clear, it does reduce gout risks. So we could drink coffee each day to help with gout.

Unfortunately, coffee is a rather acidic inducing drink that can reduce nutrient absorption, affect the microbiome, and irritate the gut. So, the use of coffee daily is double-edged. Our recommendation is to drink coffee if you enjoy coffee, but limit it to one cup per day in the mornings.

Just remember that caffeine is a stimulant that can contribute to dehydration, and keep us awake and wired' so prudent use is necessary. Furthermore, coffee consumption that affects sleep negatively wouldn't be healthy in the long run at all. Prudent sensible coffee consumption is best. A great supplemental source of coffee which contains potent antioxidants and beneficial

chlorogenic acids is green coffee extract – which can be considered for supplementation when constructing a gout treatment protocol.[204] [205]

Garlic & Aged Garlic

Allium Sativa or Aged Garlic has shown up in a study concluding that it inhibits the formation of highly reactive chemicals called AGEs (advanced glycation end-products).

What are AGEs? AGEs are basically toxic volatile molecules (free radicals) that form when foods (particularly animal proteins) are cooked at very high temperatures. AGE's can also form inside the human body when blood sugar levels are very high. AGEs can also be formed in the presence of high amounts of sugar.

The thing is, the presence of AGEs in the body is likely to cause tissue damage because of how reactive AGEs are. The tissue damage is usually small, but widely distributed, and is enough to trigger an inflammation response from the immune system.

In people with high levels of blood sugar like diabetics, or for people who eat a lot of red meat from animals (typically a common occurrence amongst people who end up with gout), the presence of AGEs is very likely. For diabetics, and people who go on to get gout, the situation will induce chronic low-grade inflammation because the regular eating of this kind of food induces tissue damage to some degree, whilst diabetics have the perfect environment for 'in-house' AGE formation because their blood sugar stays chronically high.[206]

The combination of low-grade inflammation with foods that are high in purine content is a double whammy for gout patients and should be avoided to reduce the risk of gout attacks which are painful. This is why aged garlic's ability to prevent AGE formation is very beneficial for people who want to prevent future gout attacks or diabetic problems.

Ordinary garlic, like aged garlic, is packed with beneficial compounds too. A good example is a compound found in garlic called "Allicin" which acts as a potent antioxidant[207] with strong anti-inflammatory properties.[208] Allicin is such a good antioxidant that it has even been shown to be effective in counteracting some of the impacts of malaria.[209]

Another beneficial chemical in normal garlic is "Ajoene" which has the amazing health benefits too, such as the ability to reduce throbbing painful sensations, kill fungi, remove parasites, and utterly lay waste to cancerous tumors.[210]

Garlic, especially aged garlic, is a superb gout fighter which helps to prevent damage to our tissues from sugars and proteins in the diet. This delicious herb is good for diabetics, heart patients, and gout patients too because of its fantastic anti-inflammatory properties.

Fiber

High fiber intake correlates with low hyperuricemia risks. How much lower? One study reported that eating just 19g of fiber per 1000 kilocalories eaten in total per day could reduce the risk of

hyperuricemia by as much as 55% when compared with the rates of hyperuricemia for people who ate less than half that amount of fiber.[211] A similar finding was reported in a smaller study, this time the results were true for both total and soluble fiber.[212] According to the researchers themselves, the "mechanisms" behind the benefits were "unknown". Of course, the benefits aren't really that mysterious to us because we already know from our discussion of the microbiome (chapter two of this book) that fiber really helps the microbiome to be in a happy healthy state.[213]

In addition to the above findings, fiber has also been found to reduce both high blood pressure, and high cholesterol, both are linked to gout in independent ways with respect to each other and with respect to reducing uric acid.[214] [215] [216]

Celery

That's right! This common household salad ingredient is actually chock-full of potent health-boosting compounds, particularly flavonoids. The parts of the celery plant that contain the highest concentrations of medicinal compounds are the fruits and seeds of the celery plant. This is why many companies offer celery seed extract as a supplement. Nevertheless, including celery on the list of things you regularly eat will definitely increase your intake of beneficial flavonoids and antioxidants and, the great news is that there is research to show that the benefits of celery extend to gout.

The main beneficial properties of celery are due to it containing flavonoids (see the section of flavonoids for gout below for a full discussion). Broadly speaking we can say that the benefits of eating celery are good and that those effects can be strengthened if you consume extracts made from the seeds of celery or celery oils.

Broadly speaking the benefits of celery for gout include increased urine production, decreased arthritic symptoms of pain and inflammation, and other general relief due to compounds in celery being strong antioxidants.

Two compounds in celery oil ("Sedanolide" and "3-n-Butylphthalide" [3nB]) have been directly linked with gout prevention and relief. These two compounds are both strong anti-inflammatories which act to help relieve painful acute gout attacks. These same two compounds seem to be able to help prevent bouts of acute gout attacks too. This is thought to be due to the fact that they inhibit key enzymes involved in the inflammation that causes pain during gout attacks. These compounds are also notable because they help increase urine volume which may aid in flushing uric acid from the body. Lastly, the compound 3nB was actually found to be able to lower uric acid levels because it inhibits xanthine oxidase in the liver.

So, to summarize, compounds in celery benefit gout patients because:

- They reduce inflammation and pain.[217]
- They help urine production.

- They can lower blood uric acid levels by inhibiting liver production of uric acid (xanthine oxidase inhibition)

Examples of research showing these claims include:

- One small almost anecdotal study was done on patients, who either suffered from gout, osteoarthritis, or osteoporosis, showed that after 3 weeks of taking celery seed oil the participants had at least a 68% reduction in self-reported pain (some reported a 100% reduction). Another study (which was larger in size and more thorough in design than the one just mentioned) showed that celery seed oil was significantly helpful for gout patients because compounds within the oil inhibited the production of uric acid in the liver.[218] [219]

Celery also contains many other health-promoting compounds besides the ones we have mentioned, and these all have health benefits too; just not necessarily specific to gout. Nevertheless, celery also happens to contain a modest amount of omega-3 fatty acids, and since people who suffer from gout are likely to have lower blood levels of omega-3's (particularly if they suffer from about 2 attacks or more per year) than healthy people - celery will also do its part to boost those levels a little bit.[220]

Just know that celery won't really be one of the main sources of our dietary intake of omega-3-fatty acids, but any extra sources of omega-3's in the diet are always welcome, especially if they also have other major benefits for gout like celery does have – consider it to be a little bonus on the side.

So what are some of the other benefits of celery for health? The extra benefits of celery seed extracts for health (beyond what we have already mentioned) can include the ability to lower blood pressure in people with hypertension[221], protect the stomach and reduce gut inflammation[222], help reduce overall inflammation in combination with other medications[223], as well as being non-toxic and not likely to interact with other drug therapies at relevant dosages.[224]

Celery is a great addition to the diet on a day to day basis, and its gout-fighting-health-boosting power can be augmented over defined periods extracts of the seeds (or oils) are taken in supplement form. The main benefits come from the flavonoids in the plant itself, and secondary benefits may come from its nutritional and fiber qualities.

Gamma-Linolenic Acid (GLA)

This amazing Omega-6 oil has been found to really help reduce inflammation and its benefits for arthritis ae well recorded in the scientific literature. This oil is really good at helping with sore joints and swelling.[225] [226]

Please note that the typical modern western diet is completely overloaded with omega-6 fatty acids which tend to unbalance the ratio of omega-6's to omega-3's – resulting in increased inflammation. But, the one exception to this rule is GLA. Of all the significant dietary omega-6-

fatty acids, GLA helps to *reduce* inflammation, not increase it, so we recommend it wholeheartedly.

There are a few plants that are rich sources of GLA which also have proven benefits for inflamed joints. Some good examples include:

- **Borage Seed Oil**: Can both improve symptoms related to arthritis, as well as helps with our levels of 'good' cholesterol (HDL cholesterol). Other massive benefits of borage seed oil for health are that it benefits our heart and blood vessels by lowering triglycerides, lowering levels of 'bad' cholesterol (LDL cholesterol), and reduces our risks for many different forms of heart and blood vessel diseases.[227] [228]
- **Blackcurrant Seed Oil**: This oil is actually able to reduce the inflammation and painful symptoms in arthritis.[229] [230]
- **Evening Primrose Oil**: Studies have found that taking this oil has a cumulative effect over time that increasingly reduces pain, swelling, loss of function in joints. Typically, very strong results are usually seen after three months and even stronger results from six months of supplementation or longer.[231] [232]

Folate

Another name for folate is vitamin B9, and it is another essential component of our dietary needs. B vitamins are water-soluble, thus our bodies don't store them, which is why we need to eat them to receive their benefits! We need to ingest folate in its active form (L-methyl folate) to get the full benefits because our bodies are not that good at converting the inactive form (folic acid) into usable forms.[233]

Broadly speaking, the B vitamins taken as a whole have a ridiculous amount of benefits for our health. They are all involved in breaking down lipids, proteins, and carbohydrates. They impact the functioning key organs and systems in the body and can support the health of the liver, skin, hair, and eyes.

Folate, in particular, is also very important for brain health, protects against genetic damage, and prevents the damage usually seen in people with diabetes, Alzheimer's disease, ADHD, Parkinson's, certain kinds of cancer, and just about every single condition you could think of. When vitamin B9 (folate) comes together with B12 inside the body, then it helps red blood cells to transport oxygen and other products more efficiently.[234]

In general, the B vitamins work better together than separately, so we should try to make sure we get more than enough of all of the various B vitamins in our diet. A general multivitamin B complex is perhaps also a good way to maximize the effects of your B vitamin intake if it is safe for you to supplement with one.

On the point of combinations of B vitamins working synergistically, B9 and B12 also combine to adequately reduce levels of homocysteine (an inflammation messenger molecule), breaking it

down into its building blocks. We know from our previous discussion of inflammation that heightened inflammation chemicals like homocysteine are linked to having health problems. In the case of homocysteine, heightened levels are actually linked to diabetes, heart disease, and increased risk of death from diabetic/heart problems.[235] [236] Using folate supplementation to lower homocysteine levels helps people to control their blood sugar levels.[237]

In terms of gout, one study showed that people who ingested 51.5 micrograms of folate per day from their diet had a 70% less chance of developing gout attacks than those who ate less folate than this.[238] This is a very powerful result and suggests to us, very strongly indeed, that we should make sure to eat foods containing lots of folate every day to help with gout.

The B vitamins are really good for health, and folate, in particular, seems to help with gout. This means that we should really try to get a good amount of folate in our diet every day. Making sure to get all the other B vitamins is a good idea too since the B vitamins really work synergistically together to promote our overall health too.

Special Herbs For Gout

A lot of research has been done on herbal remedies and their benefits, particularly research done in China and India on traditional Chinese and Indian herbal preparations respectively. These two ancient medical traditions have been treating gout in their own way for generations. Many of their preparations have excellent scientific support in the research literature and we will explore some of the main herbal tools for gout below.

Xanthine Oxidase Inhibitors

As we have mentioned several times previously, the main enzyme in the liver that controls uric acid production is called xanthine oxidase. So, if we can inhibit the way this enzyme works then we will lower the amount of uric acid being formed in the body. The following Chinese herbs have been used to suppress gout successfully because they have the ability to reduce the activity of xanthine oxidase: [239] [240]

The following common, or household herbs were compared with allopurinol to assess how good their xanthine oxidase inhibition. If allopurinol was given 100% then the following herbs were more gentle but extremely good too. We list some of them here:[241] [242] [243] [244]

- Israeli Chamomile (*Anthemis palestina Boiss*) - 51.5% inhibition
- Yellow Milfoil (*Achillea biebersteinii Afansiev*) - 45% inhibition.
- Common Rosemary (*Rosmarinus officinalis L.*) - 42% inhibition.
- Ginko (*Ginkgo biloba*) - 39.2% inhibition.
- Lavender (*Lavandula angustifolia*) - 28.7% inhibition.
- Marjoram (*Majorana syriaca*) - 25.1% inhibition.
- Spearmint (*Mentha spicata*) -22.5% rate of inhibition.

Skunkvine & China Root

These two herbs, skunkvine (*Paederia scandens), and China Root* (*Smilax china*) have been used by traditional Chinese herbalists to suppress gout for generations. Modern scientific research has supported the use of these herbs for gout. Studies indicate that both these herbs were able to decrease levels of uric acid in the blood. [245] [246]

Beleric

Beleric (Terminalia bellerica) has been used in traditional Ayurveda (Indian traditional medicine) for centuries. Beleric is found naturally in different parts of Asia and the dried fruit of the Beleric plant is the usual part used in medicinal preparations. The benefits of Beleric use in traditional treatments as reported in the scientific literature include the ability to lower blood cholesterol and blood sugar; protect the health of the heart and blood vessels; protect and support the liver and kidneys in the functioning; protect against damage done by free radicals, as well as reducing inflammation. All these properties make Beleric an impressively potent herb for gout.[247] [248]

The reason why Beleric has all these amazing health-promoting properties is thought to be because it is an excellent source of beneficial tannins and other related bioactive biochemical compounds that really help for both arthritis and gout specifically. Impressively, studies on the activity of Beleric have shown that it is as powerful as allopurinol in terms of its ability to inhibit xanthine oxidase.[249] [250] [251]

So, Beleric seems to perform just as well as some commonly used pharmaceutical drugs for reducing uric acid. A good example is the one already just mentioned above, but another example we could site is a study comparing Beleric's effects with that of the drug febuxostat. One study reported that Beleric was 89% as effective as febuxostat in terms of being able to reach a target (lower) level of blood uric acid. The same study showed that Beleric could actually reduce blood uric acid levels by as much as 27% - impressive indeed. Why is this finding important? Mainly because people who take Beleric almost never have negative side effects which means that it should be preferred over other conventional pharmaceutical drugs that do come with side effects.[252]

Green Tea

Green tea has a ton of health benefits so it isn't surprising that it is good for gout too. Apart from green tea being very good for reducing inflammation in the body because of its antioxidant properties, it is also a great xanthine oxidase inhibitor, which means it can reduce our uric acid levels too.[253]

Extracts made from green tea leaves contain the antioxidant compound known as Epigallocatechin-3-gallate (EGCG). This is what gives green tea so many benefits for general health that would also benefit gout patients. It is worth listing just a small fraction of them here:

EGCG has been proven to …

- Reduce blood glucose levels and insulin levels, Improves insulin sensitivity, reduces fat accumulation in the liver, enhances mitochondrial function, and combats diabetic linked damage to the retinas of the eyes. All brilliant for preventing and helping with diabetic problems.[254] [255] [256]
- Prevents large amounts of carbohydrates from being digested and absorbed too quickly.[257]
- Suppresses inflammation, protects against damage due to inflammation.[258]
- Reduces blood pressure, and lowers HDL cholesterol (the bad kind).[259] [260] [261]
- Green tea also contains caffeine which, as we mentioned previously, inhibits the production of uric acid in addition to containing other chemicals which inhibit uric acid production.

Since green tea contains caffeine it is better to take it during the day, but no later than 4 or 5 pm where it might interfere with sleep. There are tons of benefits in green tea, everyone should drink more of it, especially so if you have gout.

Other Powerful Tools for Gout

Flavonoids

Flavonoids (also known as bioflavonoids) are a whole family of compounds found in plants that help to give them their color. The interesting thing about flavonoids is that they tend to be potent antioxidants, with huge benefits for our health.

There are many different flavonoids, and each may be good for specific things. But overall we can say that what is common to almost all flavonoids is that they tend to be very potent antioxidants that reduce inflammation and protect critical body tissues from damage.

It turns out that some flavonoids can lower blood uric acid by inhibiting xanthine oxidase – in addition to having other beneficial effects due to being antioxidants. So, we should try to eat as many foods rich in health-boosting flavonoids as we can.

What are good sources of gout suppressing flavonoids? The following sources are recommended according to the scientific literature:

- Extracts from olive leaves, milk thistle preparations, and other sources of the biochemicals “apigenin”, “myricetin”, “Luteolin”, and “genistein” have shown the ability to inhibit xanthine oxidase in addition to having a huge number of other health benefits. Some of these bio-compounds have the same or better ability to reduce uric acid levels by inhibiting xanthine oxidase as allopurinol - and without as many side effects too.[262] [263] [264] [265]

- Quercetin (found in onions, apples, berries, and other foods), curcumin (found in turmeric), rutin (found in buckwheat), kaempferol (grapes, gingko biloba, broccoli, and tomatoes), myricetin, and puerarin can all reduce uric acid levels.[266] [267]
- Grape seeds and grape seed extracts have uric acid lowering properties with studies showing that the compounds in grape seed preparations were significantly more beneficial than using allopurinol.[268]

In fact, the benefits of these flavonoids are so staggering that it is worth describing them in more detail. Particularly let's take a more detailed look at the many benefits of the white mulberry tree (which contains tons of flavonoids) and quercetin (a specific flavonoid itself). These are two jaw-dropping examples of the power of flavonoids to promote good health and healing.

White Mulberry

Although you could consider the White Mulberry tree (*Morus alba*) as a herb (or botanical) for gout, we decided to explore its amazing health benefits here instead of under the "herbs for gout" section because it is an amazing example of the power that is latent in flavonoids to really boost our health and help with gout.

The White Mulberry tree (*Morus alba*) is found naturally in parts of China. Historically it was used primarily to treat illnesses in traditional Chinese style medicine (TCM) – although another common use was to use it to feed silkworms. In more modern times the plant has been used in TCM to treat gout and hyperuricemia and research is now beginning to show why.

White mulberry actually contains many different health benefitting compounds (e.g. flavonoids) which give it the ability to affect our health positively in many different ways. Usually, white mulberry is prepared in a tea, or the berries are eaten raw or whole, and in some cases, people have made the berries into a kind of traditional white mulberry wine. Compared to the stem and fruits, it is actually the leaves of the white mulberry plant that contain the highest amounts of health beneficial compounds.[269]

So what benefit does white mulberry have for gout? One of the best research results on white mulberry and gout shows that it is actually able to help your kidneys excrete urate while lowering uric acid levels in the blood. Not only that, but the same study also showed that it helped to protect the kidneys by supporting their functioning and health – in medical terms white mulberry was 'nephroprotective', meaning it protected the kidneys.

The ability to reduce uric acid, protect the kidneys, and help in eliminating urate was linked to a special chemical found within the white mulberry plant called "mulberroside-A". Turns out that mulberroside-A might be a good candidate for uric acid therapy and the treatment of hyperuricemia.[270]

The above result is fantastic for gout, but the really impressive thing about white mulberry is the fact that it has a ton of health benefits and potential healing uses in addition to the one we just

mentioned. Indeed, white mulberry is actually capable of anti-inflammatory, anti-cancer, and even anti-aging effects.[271] [272]

White mulberry apparently has three compounds (Moracin, Albanol-A, and Albosteroid) that are unique to the plant and each one of these three has the ability to promote our health.

For example:

- Moracin is a potent inflammation buster and can fight cancer.[273]
- Albanol-A kills cancer cells.[274]
- Albosteroid Prevents ulcers and acts as a good antioxidant.[275]

But, the benefits of white mulberry don't stop at just these three compounds and their effects. Many other benefits have been discovered, each linked to a particular flavonoid contained within the plant itself. The list of benefits is truly staggering and we shall explore most of the known ones below.

Anti-inflammatory Benefits, & Benefits for the immune system

- White mulberry has very good anti-inflammatory effects in the blood vessels and other areas.[276]
- It is able to affect the behavior of white blood cells to prevent unbalanced unnecessary inflammation.[277]
- White mulberry is able to calm the inflammatory response by slowing down certain key enzymes in the body – particularly due to the effects of the flavonoid moracin which is one of many flavonoids found in the white mulberry tree.[278]
- One study showed that white mulberry could improve inflammation linked to obesity and tended to reduce the levels of inflammation chemicals in the body of obese mice. Other studies on mice also confirmed the ability of white mulberry to reduce inflammation in cells.[279] [280]
- The fruit of the white mulberry tree supports and enhances healthy immune systems by boosting certain immune system responses – similar effects have been recorded for extracts made from the leaves. This is likely why it is such a good anti-cancer plant.[281] [282]

Heart Health Boosts & Benefits for Diabetes

Extracts made from the white mulberry plant benefitted heart health because they were able to:

- lower blood pressure [283]
- A study showed that blood pressure could be lowered in rats[284]
- Other notable results include the reduction of cholesterol and fat in human diabetic patients[285], decreased accumulation of fats in mouse blood vessels[286], and the prevention of obesity in rats who were actively promoted to become obese.[287]
- Other benefits for diabetes included the ability to reduce insulin levels[288] as well as glucose levels[289] whilst also promoting something called insulin sensitivity (which is a very good thing for diabetics).[290]

- Finally, many diabetics suffer eye damage and can go blind because of their diabetes. One study found that white mulberry was able to protect the eyes of mice by preventing eye cells from dying or taking damage.[291]

Although many of the above results were on animal studies, they still show huge benefits for heart health and the potential to be very beneficial for diabetic and heart-related conditions.

Reducing Cancer Risks

White mulberry and the compounds within it were found to be able to have effects on cancer and cancer cells. Examples include[292]:

- The ability to help cancer cells die and prevent cancer cells from growing.
- Stop cancer of the colon from growing and encouraging the death of cancer cells found in the colon or rectum.
- Extracts made from the bark surrounding the roots of the white mulberry plant seemed to be able to affect the normal cell functioning of cancer cells.

Improve Memory & Learning whilst reducing fatigue

- White mulberry seems to be able to reduce fatigue and tiredness.[293] Other studies showed that positive improvements in memory and learning abilities were possible, meaning that white mulberry seems to enhance the functioning of the brain.[294]
- White mulberry makes lab mice smarter in tests. The specific improvements in these mice that were recorded include enhanced learning, faster memory recall, and better retention of memory.[295]
- Another study, done on rats this time, showed that white mulberry improved memory, increased the number of nerve cells in the brain, and protected the brain from free radical damage by acting as a good antioxidant.[296]

Reducing Depression, Anxiety & Stress

Stress, anxiety, and depression are all related biologically. White mulberry may have good beneficial effects because it contains compounds that are very likely to reduce anxiety by increasing and decreasing important brain neurotransmitters.[297] [298] Anti-anxiety effects have already been observed in mice that were given white mulberry extracts.[299]

- Other animal studies have shown that certain compounds contained in white mulberry reduce “depressive behaviors”.[300] [301]
- The idea that white mulberry might help deal with biological stress is supported by the fact that it can bring cortisol levels (the so-called ‘stress hormone’) back to normal unstressed ranges.[302]

The above results are important for gout because one of the main contributors to premature aging and decline is chronic stress and anxiety. This is because such stress and anxiety play out in the

body chemically – chronic states of bodily stress actually have a degenerative effect on our health over time.

Furthermore, depression, anxiety, and stress can interfere with other factors that affect our health such as sleeping properly, or eating and digesting properly. The management of stress and anxiety is therefore important to all health.

Depression is itself linked to disrupted sleep, poor drive, poor motivation, as well as massively decreased quality of life. Pain and inflammation (like that seen in gout) are also linked to depressed moods and other poor outcomes, so if we can find something that helps with this then that is likely to be very beneficial.

Other Effects

White mulberry has mild antimicrobial properties because of the flavonoids found in it. Studies have shown that dental and oral health might improve by using the plant in a tea or eating the fruits, or by ingesting extracts made from different parts of the plant. [303] [304] [305]

Interestingly, white mulberry has the potential to reduce appetite, improve fat metabolism, and help produce antioxidant enzymes that would protect the processes of our metabolism. These results all imply that white mulberry may be very beneficial for people with obesity and/or liver problems. It could be regarded as able to protect against developing obesity as well as protecting people with obesity from the kind of cellular and physiological damage usually seen in obese people.[306] [307] [308]

Quercetin's many health benefits

We already mentioned a few of quercetin's benefits for hyperuricemia, but this compound has so many more health benefits that we think they deserve some mention here.

Benefits for heart disease

Quercetin is a very strong antioxidant and seems to play an important role in preventing cardiovascular disease. Quercetin's unique heart-protective benefits were first noticed because scientists were trying to work out why people from France had low national rates of heart disease in spite of the fact that the French diet is perceived to be rich in fatty foods and wine.

The fact that French people seemed to suffer from less heart disease was a curious puzzle to dieticians because the French diet was seemingly packed with things that were typically thought to contribute to heart disease.

It turns out that one of the explanations given for this state of affairs was that the French diet was full of sources of quercetin - which is present in red wine and some vegetables that are commonly consumed in the French diet.[309] This is also interesting from the perspective of gout because, as we discussed in section one, it used to be that red wine was thought to not contribute to gout risks at all. Only recently did research come out showing that all ethanol increases gout

risks to some extent. But why would red wine have the least negative effects? One good reason may be that it contains good amounts of quercetin.

Many studies have provided evidence of Quercetin's ability to stimulate nitric oxide. Nitric oxide prevents certain unhealthy processes in people with atherosclerosis because it keeps the blood vessel walls in good shape.[310] Another good heart health benefit of quercetin is that it is able to reduce blood pressure.[311]

The great news is that quercetin is found in many different foods, so that makes it easier for us to increase our consumption of it. Example foods that are rich in quercetin include:[312] [313]

- Capers
- Onions
- Dark berries and cherries
- Raw green chili peppers
- Red Leaf Lettuce
- Raw Kale
- Cooked asparagus
- Spinach
- Sweet peppers
- Broccoli

Notice that cherries are on this list, which might also go a long way towards understanding why they have such great benefits for gout patients even though the effects on hyperuricemia are minimal. This is once again good supporting evidence that chronic inflammation and all its associated factors are critical to understanding gout, and how to treat it in the long term.

We won't recommend all of these foods, but we will recommend some of them in the final section of this book where we suggest a simple practical plan to tackle your gout.

Cold Laser Therapy (LLLT)

Cold Laser Therapy (sometimes called low-level laser therapy – LLLT) is a form of medical treatment that uses red light, or near-infrared light laser to treat different conditions. The fact that low powered lasers might have therapeutic uses was actually discovered by accident. A Hungarian physician and surgeon by the name of Endre Mester stumbled upon a novel side effect of using a low powered laser in an experiment he ran a few years after the invention of the ruby laser in 1960.[314]

Endre was attempting to use a relatively high powered laser to treat tumors in mice (he was trying to replicate the results of another experiment), but due to an unfortunate (or fortunate) oversight there was a problem with his laser – it was operating at a far lower power output than intended. What he noticed was that his low powered laser was not able to treat the tumors, but

that the hair over the shaved areas of mice where the treatment was applied grew back much faster than on the mice who did not receive treatment. He published his results in 1967 and the beginning of a new form of low-level laser treatment for certain medical conditions was born.[315]

Although initial therapeutic results for hair regrowth were published in 1967 it was only relatively recently that LLLT has been used rather extensively for injuries and in pain management. Laser therapy is cleared by the FDA when used for the treatment of joint pain and stiffness in arthritis, or for improving blood circulation in local areas of the body. Laser therapy has largely replaced the use of ultrasound techniques for the treatment of pain effects (analgesic treatment), and its benefits are more clearly documented for pain relief than ultrasound.

Quite a few studies have been done on the exact uses and effectiveness of the technology for various different conditions, for example:

- Rheumatoid arthritis[316], osteoarthritis[317], and other chronic joint disorders[318]
- Acute, and chronic neck pain[319]
- tendinopathy (e.g. tennis elbow)[320] [321]

Unfortunately, there are only a few studies that specifically 'zone in' on using cold laser therapy for gout. One study done in 2006 [322] showed that laser treatment was as effective as NSAIDs (non-steroidal anti-inflammatory drugs – e.g. diclofenac or aspirin) in treating inflammation and pain due to gout, pseudogout and other similar conditions.

A later doctoral thesis published by Mantineo in 2015[323] shed light on prior research into the effectiveness of cold laser therapy for gout. He showed that the effects were significant and beneficial and that the effectiveness of the treatment was linked to the kind of frequency (i.e. the kind of laser) the laser was operating at. He also compared the effectiveness of those lasers to the effectiveness of NSAIDs and placebos for treating the same disorders.

Basically different kinds of laser are effective to different degrees when used to ease pain and inflammation, or encourage blood flow. The two main lasers used he investigated for cold laser therapy were a gallium arsenide laser (GaAs), and a Helium-Neon laser (HeNe), and a combination of the two together. The results he found were as follows:

Treatment Used	Effectiveness
GaAs+HeNE	78.3%
GaAs (alone)	67.8%
NSAIDs	63.9%
Placebo	34.5%

What we notice is that GaAs lasers or GaAs combination lasers were a little bit more effective than NSAIDs in reducing pain and inflammation for disorders like gout, and doubly as effective as any placebo.

Other research has reported mixed results in terms of cold laser therapy for various conditions, including gout, but this is likely more to do with the fact that not many studies have been done to test the appropriate laser wavelengths to see optimal results in gout, unlike in other disorders.

Suffice it to say, the benefits of cold laser therapy keep showing themselves time and again and can include:

- Reduced inflammation
- Reduces swelling
- Reduced chronic pain
- Reduced acute pain
- Increased blood flow
- Improved cell growth and cell stimulation (improved wound healing)

It seems that cold laser therapy works by penetrating deeply into the tissues where the light is absorbed which accelerate the beneficial activities of cells. A common result of treatment is that ligaments, muscles, tendons, and joints, repair themselves faster with better levels of inflammation too. There are no known harmful side effects of the therapy, and it is usually undetectable, painless, with the beneficial effects increasing cumulatively the more treatments one does.

These days there are good home-based medical lasers that one can buy to help you with acute bouts of gout attack. This should be an excellent way to reduce inflammation, sensitivity, pain, and discomfort during an acute attack. The great thing is that you don’t need to place the laser in contact with the affected inflamed area for the laser to penetrate into the deep tissues and do its work. This is fantastic because the characteristic feature of a painful gout attack is the unbearable sensitivity of the joint area which can make even the light touch of bed sheets unbearable to endure.

Since there are different kinds of frequencies that lasers can operate at, with each frequency being more or less effective, it might be useful to approach a professional laser therapist to ask for good advice on what your best options are when you want to buy one for yourself. This is a good idea since the professional therapist might also be able to show you how to use the device most effectively.

Given that the research results show definite benefits AND mixed results, you may want to first go to a professional cold laser therapist for your gout to see if the treatment works for you. If you find good relief from your discomfort, then you can consider getting a good home laser system that is able to get the job done – don't buy poor quality, make sure to get equipment that is able to actually help your gout. Good equipment is competitively priced, as are professional laser treatments offered by medical laser technicians.

Chapter 4

Our Choices Matter When Healing Gout Day to Day
- Gout & Lifestyle Factors -

Broad Lifestyle Tips for Gout

Our day to day lifestyle choices and activities can have a massive effect on our health in general, and gout specifically. There is a lot of scientific data that has been collected over the years showing that huge reductions in a person's risks for gout can be achieved through alterations in lifestyle alone.

As a sort of brief introduction to the kinds of things that we'll talk about later on in this section, consider the following simple tips that have very good benefits for gout patients.[324]

Daily moderate exercise and reducing weight sensibly:
Both moderate exercise and sensible weight loss have been shown to reduce uric acid and lessen gout risk. In particular, higher body fat percentage is linked to much greater risks for gout – obesity is a risk factor for gout (and many other horrible health conditions).

Limit how much red meat you eat:
High purine foods like beef, pork, lamb, some sea fish, and shellfish can massively increase your risk for gout.

Getting the right balance of omega-3, fish meals, and omega-6
Fish are a great source of soothing omega-3 fatty acids, which would help gout patients significantly. Unfortunately fish are also high in purines. We need to ingest enough omega-3 fatty acids to balance the amounts of inflammation-causing omega-6 fatty acids, but at the same time, we should try to limit our fish intake.

This means that for many gout patients a good strategy would be to take omega-3 fatty acid supplements, at least in the beginning of any smart, well worked out gout treatment plan. Examples of great omega-3 supplements include good quality, pure fish oils, or algae extracts that contain lots of inflammation-busting DHA and EPA.

If the fish oil is high quality and comes from a trusted ethical supplier then it will be fresh (not rancid) and be free of any mercury contamination, as well as having almost zero purines – perfect for people who want to get rid of gout.

Eat Foods which are prebiotic & probiotic

We explored the wonderful power of the microbiome to support our health in chapter two, and in chapter one we noted that low-fat dairy seemed to benefit gout patients. Here, in this chapter, we recognize finally that the benefits linked to low-fat dairy might just be because of the probiotics in the dairy. The alternative to diary would, therefore, be good probiotic foods. Try to emphasize great probiotic and prebiotic foods in your diet – you should see great benefits over time.

Eat proteins that don't contribute to uric acid

Nuts and legumes (like sprouts) contain proteins, but these proteins don't contribute that much to uric acid formation. In fact, low purine diets are great for gout, but the type of purines matter and the source of the purines seem to matter too. We're going to recommend cutting out all purines as far as possible (at least in the beginning) to be absolutely certain you get the benefits. Don't worry, we'll recommend some good protein sources that you can actually eat too.

Eat an Alkaline Diet

A diet that encourages the body to become more alkaline is one that will also encourage the body to make urine that is not acidic. This is an important factor for gout because uric acid can only pass into the urine as urate if the urine forming in the kidneys is not too acidic. Unfortunately, the kinds of diet that typically lead to gout attacks are also the kinds of diet that promote acidity. Let's combat our gout by emphasizing alkaline foods. We'll talk a bit more about this later in this section.

Abstain from, or drastically reduce alcohol use

Contrary to what people used to think, ALL alcohol makes painful gout attacks more likely. Of the whole range of alcoholic drinks available, beer is the worst for gout risk, whilst wine is the least bad. Somewhere in the middle of the two are spirits, however, we should be careful with regard to the mixers you use too, high sugar and other ingredients in the mixers can make the drink much worse for gout than it already is.

Cut down how much sugar you eat

Simple things make big differences here. Examples of quick and simple easy fixes you could make are to add one less spoon of sugar to your tea or coffee every time you make one, or never drink sugary soft drinks again.

Substitute your regular fruit juices with fruit juices containing the pulp. Better yet, squeeze your own juice, leave the pulp in, and make sure to get pesticide-free, organically farmed non-GMO produce. Even though fruit juices will still contain fructose, the pulp in the juice helps the microbiome, and this will end up being a lot better for you than drinking carbonated soft drinks with lots of sugar or artificial sweeteners in them.

Eat low GI Foods

We will talk about the glycemic index (GI) in much more detail later in this chapter, but suffice it to say for now that research has shown that high GI carbohydrates (high GI sugars) actually

increase blood levels of uric acid. The implication is that low GI carbs are better for health, particularly for people at risk for gout.[325]

Just doing the above should result in fewer gout attacks, less chronic inflammation, better digestive function, and better all-round health. But there is so much more that we could explore about diet and lifestyle – there are literally hundreds of strategies for gout relating to diet or lifestyle. We want to thrive every day; this section aims to show us the kinds of things that will achieve that.

DIET & LIFESTYLE

Most people with gout know that their diet and lifestyle choices are the main cause of their ill-health. So, people know that they will have to change certain things in their diet and adopt some new lifestyle perspectives to help prevent gout attacks. The question is what diet and lifestyle factors, exactly, would be good for gout?

Is exercise good for preventing gout; and If yes, then what kind of exercise? If I need to adopt a certain diet to prevent gout, then what kind of diet should I adopt, and why? Are anxiety, stress, and sleep impacting my gout risks; and if yes, what can I do to manage these things?

These are the kinds of questions we will be asking and answering in this section. Naturally, this is one of the most important sections for understanding the kinds of diet and lifestyle factors that we should be aware of in order to combat gout.

Before we begin describing diets, exercise, stress, sleep, and beneficial strategies it might be good to remember a few important points from chapter one and two that help to make this chapter more understandable.

If we remember the risk factors for gout and hyperuricemia then we can understand why certain diet and lifestyle factors can really help. This is because we can prevent or treat gout by removing the risk factors from our lives. If you remove the factors that put you at risk for gout attacks, you are unlikely to have any gout attacks – that's how it works. So, the risk factors for gout we should remember are:

- A condition called hyperuricemia (too much uric acid) is the main risk factor for gout. So, things that increase uric acid production will increase gout risk, especially if you have hyperuricemia.
- Purines in the diet contribute to more uric acid.
- If you have gout you have higher levels of uric acid. Having high levels of uric acid is itself a risk factor for diabetes, obesity, heart diseases, and other problems – not just for gout.
- Having an unbalanced microbiome is a feature of gout. In fact, this feature is so strong in gout that it can even be used to predict or diagnose gout.

- People with gout have similar microbiome profiles to people with diabetes, or people with obesity, or people with irritable bowel disease (IBD). Supporting the microbiome to avoid any of these disorders should help with preventing gout since they share very similar characteristics.
- Chronic inflammation is a feature of gout and may be a contributing risk factor for gout attacks. Chronic inflammation is also a characteristic feature in diabetes, obesity, heart diseases, and many other problems. Reducing inflammation, particularly chronic inflammation, by reducing lifestyle activities that contribute to inflammation will help with gout - just like it would help with obesity, heart disease, IBD, or diabetes.

Hopefully, we can see from the above that if something helps for obesity, or diabetes, or irritable bowel disease then it has a very high chance of helping for gout too. Not only that but if we understand that *our gout is itself a risk factor* for these other diseases, then by preventing these other diseases we are likely to help prevent the progression of our gout into more serious conditions.

The implication of all this for us is that gout is actually a condition that tells us that we are in danger of developing even more serious problems if we aren't proactive. Gout is an early warning sign that things are out of balance, uric acid levels are too high, and other things are coming on the horizon, things like heart problems, diabetes, or obesity for example.

When we talk about diet, we must take this into account. A diet that reduces inflammation is a good general place to start. A diet that reduces purines, supports normal uric acid levels, prevents diabetes, obesity, and gut problems….these are the general characteristics of a diet that should be very effective at combating gout.

When we consider exercise, stress relief, or helping sleep, the same considerations apply. Whatever promotes normal weight, prevents inflammation, keeps sugar at appropriate levels to limit body damage, and keeps uric acid lower – those are the things we should emphasize day to day. In this section, we will describe some of those kinds of things and in the next chapter, we will make specific practical suggestions on how to implement these things – that is where we are ultimately going. Let's get to it.

Is Our Modern Western Diet Bad For Us?

The short answer is, "Yes". The long answer is that it is bad for us for many different reasons. One of the main reasons (but definitely not the only reason) is the huge amounts of sugar that a modern western diet usually contains.

Now, why would sugar be a relevant concern for gout? Well, obesity is a major risk factor for *both* gout and diabetes. Gout is also a risk factor for diabetes and obesity. High blood sugar levels contribute to chronic inflammation. And finally, but most relevant for gout, sugar increases uric acid levels. So, yeah, sugar in the diet is quite a big issue for us, especially when certain dietary sugars contribute to high blood sugar levels.

Our modern western lifestyle is packed with an overwhelming number of opportunities to ingest food and drink that contain vast amounts of added sugar. Much of the time our modern sugar intake doesn't come directly from glucose, or sucrose (table sugar) but from other, alternative forms of sugar – it turns out that many of these alternative forms of carbohydrates or sugars are in fact bad for our health – especially in high quantities on a regular basis.

The tight relationship between obesity, diabetes, and gout can be especially potent. Why would this be? The most likely reason is that accumulated fat can actually induce inflammation and interfere with how insulin works in the body. The main way that accumulated fat interferes with insulin is through a whole bunch of chemical reactions in the body linked with inflammation. As a result, obesity can dramatically reduce a person's life expectancy, especially in combination with diabetes –gout and hyperuricemia happen to be major contributing risk factors for both.[326]

There are other links between obesity and diabetes aside from the destructive effects of inflammation leading to a disruption of insulin functioning and widespread low-grade tissue damage. It turns out that obese people have much higher levels of insulin in their blood on average. In the medico-scientific research literature, higher average blood insulin levels are quite strongly linked with diabetes. An added wrinkle to the story is that lower average blood insulin levels are linked to effective weight loss. When do our insulin levels rise? They rise whenever we eat and digest carbohydrates because insulin is one of the important chemical messengers the body uses to tell cells to take sugar out of the blood and use it.

What does this mean? It means that obese people have higher insulin, just like diabetics, and, if we reduce insulin levels we also have a better shot at weight loss. This implies very strongly that tackling diabetes also means tackling obesity, and tackling obesity means tackling gout, which means tackling our weight. So, reducing blood sugar spikes and reducing insulin levels should help gout patients keep their weight in optimal ranges, which should reduce risks for gout attack quite a lot.

All these tight relationships between insulin, diabetes and obesity also show that once an obese person develops pre-diabetes and starts to become resistant to the signaling of insulin then they are more likely to gain weight which in turn is more likely to raise insulin levels, which in turn is likely to contribute to obesity that contributes to diabetes that contributes to obesity and so on – a nasty catch-22 cycle of degenerating health! A cycle that gout patients are also vulnerable to fall into if they don't take adequate care of their daily diet and limit uric acid levels. Breaking the cycle has to come with lifestyle choices. The best way to break the cycle is to not allow it to happen in the first place, if possible.[327]

Experts have found that insulin resistance (one of the most important factors for diabetes) most commonly begins in fat cells, and this happens because people tend to consume more alcohol or fruit sugars than the body can safely deal with over time – precisely the same story exists in gout,

except that in gout the expression of disease happens with purine metabolism before it leads to diabetes.

Over the long haul, people with chronically high blood glucose levels ultimately end up with serious damage to multiple organs and tissues. Diabetes thus leads to kidney damage, blood vessel damage, nerve damage, and damage to the pancreas.[328] Kidney damage is itself linked to gout, and gout itself arises from a diet high in alcohols and purines - this widespread organ and tissue damage can accumulate over time leading to serious heart problems, high blood pressure, kidney failure, blindness, loss of nerve function, and many other nasty symptoms.

So, we have seen that obesity, insulin resistance, fat functioning, carbohydrate intake, gout, kidney functioning, uric acid metabolism, and diabetes are all highly interrelated. Because of this fact, we can clearly conclude that one of the main problems with the modern western diet is that it is loaded with extra sugar.

It is almost certain that the modern western diet and its emphasis on carbohydrates are likely to be one of the main culprits in the rise of chronic lifestyle diseases. It is certain that fundamentally speaking the modern western diet promotes inflammation.
So, sugar and an emphasis on high carbohydrate intake is one reason why the modern western diet is very bad for health.

Another concern with the modern western diet is that modern convenience food is loaded up with saturated fats in addition to very high amounts of sugar - Cheap, tasty, quick and convenient, but not healthy.

Many of these saturated fats contribute to inflammation whilst being empty of any good nutritional stuff. Also, much of the saturated fats we do get in our diet come from eating animal sources of protein which are also very high in purines that contribute to gout.

Overall then, we should be watching what we eat and make sure that the types of fats and sugars we eat, and the amounts we eat, do not contribute to a dangerous cycle of degeneration linked to gout, obesity, and diabetes. We must become conscious of how our food interacts with our body; how it spikes our blood sugar, and how it encourages inflammation.[329]

So why don't people just stop eating diets crammed with sugar and saturated fats?

If it were that easy, people would simply do just that. Unfortunately, we should be clear about why losing weight is sometimes so difficult for us. In very simple terms, eating a diet rich in fiber and complemented by healthy fats definitely leads to slimmer bellies and much better overall health – health that is relatively easily maintained once achieved.

How do we know this? The statistics show that in countries where the cultural norm reflects a high dietary intake of fiber, then obesity is not as prevalent as it is in the west. This is clearly

reflected in eastern and Asian countries where obesity occurs in a small percentage of the population and this occurs only when traditional values have been 'influenced' by western dietary models. Studies that track immigrants' health and weight status when they move to the west and adopt the western lifestyle have clearly shown this exact trend.

The main difference (but not the only difference) between east and west in terms of diet is that in the west we have low fiber diets; the east has higher fiber diets. Increasing dietary fiber is one of the healthiest most natural ways we can regulate our weight, support the microbiome, stop dreadful sugar cravings, and prevent gout, diabetes, ad obesity as well as other chronic lifestyle disorders.

The Sweetest Poison – A bitter truth

The fact is that even if we consciously try to stay away from sugar in our diet, we still end up consuming vast amounts of it. How could this be? This happens because, unknown to most people, sugar is usually added to just about every commercially prepared food or beverage - although most of the time people don't realize this because the sugar is added in different forms under different names.

Another explanation for why people eat sugar even though they know (vaguely) that it is bad for them is that they simply don't care. To be sure, many people are eating vast amounts of sugar in their diet simply because they like sweet foods and don't really care about any negative consequences. This food strategy is certain to produce negative effects in later life where it is guaranteed that they will care.

Many people may know that sugar is 'bad' but their understanding of just how bad is vague and 'fuzzy', as such they don't understand the real dangers and continue to blithely play roulette with lifestyle diseases like obesity, gout, and diabetes and many others. In other words, people know that sugar is bad for health, but they don't know how bad, so they underestimate the dangers. This kind of attitude to sugar consumption is often accompanied by the belief that if sugar were really that bad then regulations wouldn't let sugar be so available. The fact is that simple sugars in large quantities are very bad for health, and no there is no regulation to limit it, so the previous reasoning is actually false.

A further explanation for why people eat so much sugar even though they know its bad for them can come from understanding the context of the modern western lifestyle. The modern, urban lifestyle is fast-paced, stressful, and time-demanding. This kind of lifestyle makes the choice to eat prepared commercial fast foods very tempting, because such foods are convenient on the go, and do not cost any time for preparation – they are typically inexpensive.

It is usually the case that the cheapest, 'tastiest', and most convenient foods available on the commercial market (e.g. fast-food takeaways; pre-packaged commercial meals or microwave TV-dinners) tend to be very high in saturated fats, sugar, and salt. Over time, the kinds of stressful busy lifestyles that make us turn to these non-nutritious convenience foods will tend to

combine high-stress and anxiety with poor nutrition – an inconspicuous yet deadly health combo that definitely leads to disease and poor overall quality of life.

Indeed, the cost of this kind of lifestyle can be devastating. Although the costs are not immediately apparent because they accumulate over time, it is important to recognize that most people only realize the health costs of their lifestyle choices when their body is not functioning properly (e.g. by the time we get our first gout attack, or heart attack, or diabetic incident). Of course, if you have gout, or have a heart attack, or start having diabetic symptoms, then you are already quite ill and would have to work much harder to reverse the damage already done by one's lifestyle choices. Depending on how far things have progressed, it can usually cost significant funds and energy to redress the situation – though it can be done in almost every case which is at least good news!

What can be done immediately to improve the benefits of our diet? We can first begin to remove our ignorance of the important factors involved with diet and lifestyle. Begin by understanding why sugar is so bad for us. Then we can learn about sugar and the different forms it can take in our food. Then we can stop buying and eating products that have extra sugar added to them. This should make a massive difference in our sugar intake. Another immediate thing we can do is try to cook as much of the food we eat ourselves. This makes sense because then we are in control of the things we eat, the ingredients, and the way our food is prepared. Of course, we aren't saying that you shouldn't eat out, or that you shouldn't eat the food at a friend's dinner party. We are saying that where it makes sense, try to buy and prepare the ingredients of your meals yourself.

One of the main ways we can improve the health benefits of our diet is to reduce sugar intake. For that, we need to know the different names of sugars that are commonly added to food products and ingredients so that we can avoid the mistake of eating excess sugar without realizing it. Another thing that will really help with our gout is to reduce our purine intake, eat foods that are alkaline (not acidic), and eat foods that support healthy microbiome functioning. Though we are jumping ahead of ourselves a bit, we will discuss these dietary factors in sections to come. For now, let's keep on the topic of sugar and keep exploring.

As scientists increasingly began to find out and show how bad sugar is for the body, so the number of articles and information available to the public on the subject began to explode in number. This explosion of scientific data on sugar in the public sphere has led to a kind of sugar information overload. This means it is actually pretty easy to get confused over conflicting information – we need to get the basic facts and move from there.

Once you have understood the basics we will equip you with simple ways to keep your blood sugar levels in optimum healthy ranges. This is of particular importance to diabetics, but still very important for gout patients too.

What is Sugar?

There are actually many different kinds of sugar, not just the table sugar we all know, and love to put in our tea. So the word sugar can actually refer to a whole family of chemical compounds known as sugars. In more scientific/dietary terms, sugars are also called "carbohydrates" which is simply another name for the collective group of chemicals called "sugars". Sugars are called "carbohydrates" because all sugars are made up of combinations of carbon, hydrogen, water molecules, and oxygen - hence 'carbo'-'hydrates' (literally 'carbon'-'waters').

There are basically two categories of carbohydrates ("carbs"), simple ones and complex ones. Complex carbs are built up by adding many simple carbs together in longer and longer chains. When we eat carbohydrates, our body breaks them down into smaller and smaller units and then absorbs them for use in making or storing energy. This process is called digestion and metabolism. What happens during digestion is that complex carbs are broken down into simple carbs to make them easier to absorb. The body then uses simple carbs or sugars to generate chemical energy during metabolic processes.

Digestion of carbs begins from the moment we put food into our mouths where it mixes with saliva and gets crushed by chewing. Saliva actually contains a specific enzyme (called 'salivary amylase') that works to break down starch into simpler carbohydrates (starch is basically a very long chain of simple carbohydrates joined together – starch is, therefore, a sugar, albeit a very complex sugar).

Here is a short list showing some of the different carbohydrate types:

Simple Carbohydrates

- Monosaccharides
  ("Mono-" meaning "single" e.g. glucose, fructose, etc.)
- Disaccharides
  ("Di-", meaning two or double e.g. sucrose)

Complex Carbohydrates

- Oligosaccharides
  ("Oligo-" meaning relatively few units, but more than two/three)
- Polysaccharides
  ("Poly-" meaning "many" e.g. starch, glycogen, etc.)

So we can see that glucose is made up of one saccharide unit. A saccharide is just a fancy term for the simplest sugar molecule in a family of sugar molecules. Sucrose (common table sugar) is a disaccharide, which means it is made up of two smaller mono-saccharides; in this case, sucrose is made from one glucose molecule joined with one fructose molecule. The trend continues with longer and longer chains of monosaccharides resulting in more and more *complex carbohydrates*. Starch is a great example of a typical complex carbohydrate because it contains

very many linked glucose molecules joined together (starches can have as many as 300 to 1000 glucose units linked together).

By the time our complex carbohydrates are digested, all that the body is left with are the simple sugars that made up the larger sugars.[330] The three main monosaccharides that we commonly eat in our diet are:

Glucose - The kind of sugar that comes from vegetables (and many other food sources)

Fructose - Fructose is the kind of sugar that is found in fruit and is one of the main components of ordinary table sugar along with glucose.

Lactose - Lactose comes from dairy products.

➔ Fructose + Glucose = Sucrose
➔ Glucose + Glucose = Maltose
➔ Lactose + Glucose = Galactose

We Need Sugars for Energy, why are they bad?

Yes, it is true that sugars (aka carbohydrates) are necessary for biological survival. The body needs carbs to generate its energy. We aren't saying that carbs are toxic and that we don't need them. We are saying that the type of carbs, and whether we excessively consume certain carbs really does matter to our health.

Recall that the body uses simple sugars for its needs. When we eat complex sugars it needs to break them down via digestion into simple sugars – which are useful. So, the question is, why not save time for the body and just load up on simple sugars. Actually, it turns out that this is what is unhealthy for our body. The reasons are pretty straightforward. When we eat simple sugars they don't need to go through a lengthy process of digestion, they can be absorbed directly and rapidly into the bloodstream. This might sound like a good thing for the body, but unfortunately, if we eat our sugars this was then our blood levels of glucose will spike, radically. Turns out that high concentrations of blood sugar have damaging effects. The body actually tightly regulates and controls its blood sugar levels to make sure that energy levels are correct for what it needs, and to limit any the potential of any damage being caused.

Why do high levels of blood sugar lead to damage? The mechanisms are a little bit complicated, but it makes sense if think about sugar in simple terms. If sugar is the main nutrient that the body uses to make its energy, then simple sugar molecules are high energy molecules. This means that they are pretty reactive, volatile compounds – especially when they are used to generate chemical energy for the body. This kind of reactivity is one reason why damage can occur. There are other metabolic reasons why high blood sugar can lead to damage.

Another point we should understand is that if our blood sugar spikes radically, the body will have to make some kind of response to get the levels back into normal, healthy, and safe ranges. The higher the spike, the more pressure the body will be under to manage the situation. The main way the body deals with high blood sugar levels is by releasing the hormone insulin, which tells the cells to "please absorb glucose out of the blood" for use or storage. Diabetics have problems with their insulin signaling or production, and for them, they can't get their sugar levels back down if they spike up which leads to severe problems and tissue damage over time. Diabetics can get eye damage and other tissue damage just because of not being able to control blood sugar levels.

Now, gout patients usually don't have problems regulating their blood sugar, if they did, they would have diabetes too. But, even in non-diabetics, massive blood sugar spikes still cause damage and put the pancreas under pressure to control levels properly. If we are always eating simple sugars in large amounts, then we will be constantly dealing with this problem.

Oftentimes the body's response to spiked blood sugar levels can be heavy-handed and blood sugar levels can swing too low. This can generate more feelings of hunger, drowsiness, feeling shaky and so on - Which may lead people to eat lots of sugar again, causing another blood sugar spike. This cycle of high blood sugar, dropping to low blood sugar, leading to high blood sugar spikes again… is an unhealthy cycle that can really affect a person's energy levels throughout the day. Also, over the years, negative health consequences will arise because of this kind of approach to eating.

So, sugar is not bad for the body if we eat it in the form of complex carbohydrates. Also, as with anything, this will be true if we don't eat excessive amounts of carbohydrates in total. So, eating the right kinds of carbs, in the right amounts, along with a varied diet will be the best option for dietary health in general.

Aside from avoiding these blood sugar peaks and troughs, and avoiding damage from high blood sugar levels, it turns out that eating complex carbs (polysaccharides) also have a number of other benefits. Here is a shortlist of some of the main useful functions that complex carbs have in the body: [331]

- Energy Storage – The body can store simple sugars in packets of long chains to use later. Usually in the form of glycogen (in animals) or starch (in plants).
- Structural support in plants – like cellulose in plants; chitin in insects, spiders, and some shellfish
- Genetic material - DNA and RNA are actually built on a sugar-based skeleton or backbone.
- Helps support immune function – sugars actually support the functioning of many molecules used by our immune system to protect our bodies from disease.

- Sugars help to prevent blood from clotting – useful to stop blood clotting in the wrong place e.g. inside blood vessels.
- Sugars are important energy sources for sperm motility and are critical for human fertility.
- Sugars support the growth of developing embryos - Without sufficient sugars, there would not be enough available energy for cellular division, growth, and maturation.
- Dietary fiber - Fiber is actually a collective term for indigestible forms of very long complex carbohydrate chains. Dietary fiber is very important for many healthy digestive functions because of its mechanical properties.
- Dietary fiber and complex carbs also provide the kind of sugar that benefits a healthy microbiome because this is what many of the bacteria in your gut prefer to eat.

When people talk about "calories" or "kilojoules" they are talking about units of energy that our body derives from food. Roughly speaking, for every 1 gram of sugar that we eat, we make about four calories of energy. This figure is slightly more or less depending on whether the sugar is simple or complex. This means that the energy delivered by complex carbs is roughly the same as the total amount the simple carb equivalent would give. The energy is about the same for complex carbs, but the digestion is nice and slow for complex carbs, so they do not spike your glucose nearly as much as simple carbs. [332] [333]

So, we need to eat carbohydrates for energy, but we don't need to load up on simple carbohydrates – that would cause damage over time because of wild swings in our blood sugar levels, especially in the long run.

For gout patients, simple sugar intake increase uric acid production, so we don't want our blood sugar levels spiking and contributing too much to uric acid – that would make it more likely to suffer gout attacks in the long run. This means that we should try to eat more complex carbs than simple carbs in our diet.

A nice way to know whether a food source of carbs is loaded with simple sugars or not is to refer to what is known as the "Glycemic Index".

Same Energy, Different Delivery

As we just mentioned, different forms of carbs in our diet are absorbed at different rates, even though the same energy is provided in total. This means that if we eat simple sugars our blood very quickly becomes flooded with high levels of sugar. Unfortunately, when people get blood spikes in sugar, the high levels can contribute to inflammation, uric acid production, and other problems – especially for diabetics, who cannot control their glucose as well as others.

Even non-diabetics will still have to deal with very high blood sugar levels for a brief time before their bodies get it back down to normal levels.

A special index was created called “the glycemic index”. This index puts a number to a carbohydrate food. The number allows us to see exactly how much that food might spike our blood sugar compared to eating table sugar. The higher the glycemic index, the worse it is for us. Low numbers indicate that the release of sugars from digestion is slow (good for gout, diabetes, obesity, etc.) and higher numbers indicate that such food sources are rich in simple sugars and will flood the blood with sugar (not so good for gout, and terribly dangerous for diabetics).

What is the reference point? The index compares eating foods with a standardized pure glucose solution in water. On the basis of this comparison, a number was assigned to each kind of food source of carbohydrates. Glucose has a score of 100, so 100 on this scale is very dangerous for diabetics and pretty bad for gout patients – anything on the high end of the scale should probably be avoided as often as possible.

Preventing huge blood sugar swings has many benefits, not least of which includes better-sustained energy, fewer energy slumps, better overall attention span, and better overall mood to name just a few.

For your convenience we have included a standard copy of the glycemic index for the most common foods in an appendix 2 at the end of the book – refer to it as and when you need to help you decide whether one carb might be better than another in your favorite recipes.

Use the Glycemic Index

Here is some simple, solid, and practical advice – use the glycemic index (GI) to help increase complex carbs, and reduce simple carbs, or reduce foods that will spike your blood sugar. We’ll explain about the GI and how to use it here.

If you take a quick glance at the glycemic index in appendix 2, you may notice that it is the simple sugars (mono- and disaccharides) and foods that are highly processed or refined containing simple sugars that are the most likely to have high index values (higher numbers on the GI). This means that those are the foods which are most likely to spike blood sugar levels.

Therefore, a simple and good guideline that people can follow is to decrease the number of simple sugars in their diets by choosing carbohydrate foods which have low numbers on the scale. We should also increase the amounts of complex carbs relative to simple carbs. This advice is to be recommended to everyone and not just gout patients, diabetics, or obese people – specific exceptions notwithstanding.

Why do simple sugars cause such fast and extreme blood sugar spikes? The reason is basically that the body does not need to go through so many steps of digestion to reduce simpler sugars into monosaccharides like glucose - the process happens faster than for very long and complex carbohydrate molecules.

The foods that seem to contain the highest concentrations of simple sugars tend to be highly refined and processed. Examples include fine-grain table sugar, sweets, baked treats, refined and ground white flours, jams, biscuits, fruit products like fruit juice and so on.

Basically, it happens that the vast majority of cheap popular commercial food products in use by households and businesses tend to contain highly refined processed carbohydrate sources that definitely put a strain on our bodies when ingested. So, even though most of the products are from natural living sources, it is the refining of the plant source (e.g. flours and grains) along with added sweetening agents that make them particularly high on the glycemic index and hence particularly bad for our health over the long term.

Simply put, an easy practical choice for health would be to choose complex carbs over simple ones every time – especially avoiding highly processed and refined options.

Spiky blood glucose profiles tend to encourage craving, binge eating, drowsiness, fatigue, and the need to eat again soon – such cycles are not uncommon in diabetics and people who are obese. Breaking this cycle by preventing it in the first place is a good and healthy approach to diet and should come with many benefits.

Foods which are rich in complex carbs are usually unrefined and unprocessed. Examples include whole foods like whole fruits and vegetables, legumes (beans), tubers (roots) and wild brown rice just to name a few good sources.[334]

The reason why we recommended trying to cook your own meals at home whenever possible is so that you get to control your ingredients, and here we see that it matters a whole lot what you eat and what ingredients you use to prepare what you eat. Buy whole foods, prepare them from scratch and enjoy a significant rise in personal health and wellbeing just from one simple change in your food emphasis and behavior – it can be that easy, and it can be a lot of fun to learn new cooking recipes too.

Also interesting to point out is the synergy and interconnectedness of living ecosystems and our energy production. Plants generate oxygen and carbohydrates, which we breathe in and eat respectively. During our metabolic process, we breathe out waste products from our metabolism like carbon dioxide and water which the plant then absorbs to furnish its own needs, ultimately releasing oxygen as a waste product. Every in-breath is by the generosity of plants and every out-breath is our reciprocity – our gift back to them. Also, don't forget your microbiome, they love fiber and long complex carbs too, we should take care of our internal ecosystems too, especially in cases of gout.

High Energy Reactions Can Have a Cost

We mentioned before that sugars are high in energy. That is why the body uses them to generate its own energy from food. Of course, high energy chemicals tend to be more reactive and

volatile. This means that they need to be managed in the body, something which the body manages to do just fine unless something goes wrong.

In the cells of the human body are tiny little cellular structures (little organs in cells, "organelles") called mitochondria. The mitochondria are where the body makes energy from carbs. The mitochondria can be thought of as the energy factories of our body.

If these high energy reactions are not under complete control and efficiency then they can react improperly and generate different kinds of waste products called, "free radicals". These highly reactive oxygen species are then free to roam around the body reacting with many different tissues and chemicals causing damage. Scientists have called these unwanted reactive molecules "reactive oxygen species" or "ROS" for short, but most people have heard of them being called "free radicals".

Free radicals are "free" in the sense that they float around the body and are highly volatile – free to react with whatever comes their way in an uncontrolled fashion. Essentially, these renegade ROS are hungry for electrons and will hijack any spare electrons from whatever they come across – this is very similar to how acidic or corrosive chemical reactions work.

Unfortunately, chemicals that can react willy-nilly in the body cause tremendous damage to healthy structures and tissues. So, free radicals have rightfully earned a reputation in health circles as 'bad guys' because they contribute to aging, tissue damage, tissue degeneration, diabetes, inflammation, obesity, gout, and a whole host of other serious problems.

The damage from free radicals tends to accumulate over time and it is thought that this is the most compelling explanation for the degeneration and decline of the body in appearance and function as we age. Unless we can combat the formation of free radicals, either by preventing their formation in the first place by keeping our metabolism optimal, or by soaking up the free radicals in some way (or both), then it is certain that we will age at an accelerated rate along with having high chances for developing gradual degenerative problems in later life.[335]

Bringing the mitochondria back into balance and supporting their functioning is essential to promoting good energy metabolism, as well as longer-lasting and better quality of life. Healthy eating, careful dietary choices, exercise, antioxidant consumption, and many other strategies all aim to reduce the gradual cumulative effects of free radical damage.

What does sugar have to do with free radicals? Turns out quite a lot; excessive sugar consumption directly contributes to the formation of free radicals. Simply ingesting too many simple sugars on a chronic basis can raise insulin and sugar levels chronically - causing increased ROS formation which leads to inflammation, higher uric acid formation, and many other problems.[336]

It seems that this phenomenon is globally quite common. Why could this be? There are likely to be many interrelated factors but one of the main ones is probably excessive dietary ingestion of sugars over long periods of time. This excessive sugar intake is linked to cultural preference and food production practices – a lot of sugar is added to commercial products. Indeed, people are most likely unaware of just how much sugar they are eating because it is being added to so many processed foods in so many different forms.

To prove our point about how much sugar is being added to foodstuffs in various different forms try out the following little task, you might find the results surprising.

Go and take a look at your pantry/larder and fridge/freezer. Pull out a few items to inspect their ingredients. Chances are, most (or a good proportion) will have some form of added sugar – even if you don't recognize it.

To help you to recognize if the particular products in your pantry have added sugar, we have drawn up a useful table of commonly added naturally derived sweetening additives that can be found in many foods. You can check the labels of your products against the list in appendix 3 to recognize added sugar where you find it.

What is more concerning than the sheer size the list in appendix 3 is that it isn't even exhaustive. People are eating much more sugar than they realize and it adds up to very poor health outcomes over many years. Now you know!

How much Sugar Can We Eat Daily (and still be healthy)?

Traditionally speaking, western dietary guidelines have recommended that approximately 45 – 65% of our daily food intake (for adults) should be in the form of carbohydrates. [337]

Alternatively, the World Health Organization (WHO) has encouraged people to consume an even greater proportion of carbs – their range is between 55% and 75%. This is basically saying that of all the energy we need to consume daily to survive and thrive, the WHO suggests that between 55% and 75% of it should come from carbohydrates.

However, the WHO also stipulates a condition that says that of those carbohydrates that are consumed for this energy budget, no more than 10% of them should be simple carbohydrates. So to recap, according to the WHO and other historical-based scientific recommendations, our carbohydrate consumption should account for between 45 and 75% of our energy production. Of those carbs consumed, only 10% of them should be simple carbs.[338]

More recently than the above-mentioned guidelines, the WHO has now advised that the *maximum* simple carbohydrate/sugar intake should be 25g (approx. 6 teaspoons) daily and no more. The rationale for this suggestion is that "…limiting simple carbohydrates to only 5% of total carbohydrate consumption would increase health benefits…"[339]

The current trend in scientific literature is to increasingly emphasize that *any* simple sugar in the diet is too much for the body to handle optimally. For the purposes of this book, a moderate approach is felt to be best (tailored to the specific contexts and characteristics of each individual case). By moderate we mean to simply suggest limiting simple carb intake to a maximum of 25g per day – the rest of the energy budget for carbs can easily be acquired by eating complex carbs. Doing this much should go a long way to help prevent serious blood sugar spikes, especially over many years of eating much less simple sugars – the benefits would be cumulative.

The clear message so far, in terms of carbohydrate consumption, is that how much you eat and how healthy that actually is, happens to depend on the type and quality of the carbohydrates you eat. Once again, low glycemic index foods loaded with complex carbohydrates and whole unrefined substances with few additives would seem to be the best option in terms of carbohydrate energy eating. The corollary to this is that high glycemic index foods which are packed with simple carbohydrates and are highly refined will definitely have serious health consequences in the long term.

How Much Sugar Are People Actually Eating?

A few studies have been done on sugar intake, one interesting study compared the average sugar intake for adult populations across different countries. Some of the findings are revealing, for example, one finding showed that in the United States of America (US) the average daily simple carbohydrate intake was a staggering 122g per person! [340] [341]

Consider that the above finding is roughly five times the *maximum* amount of 25g simple carbs recommended by the WHO. People are consuming far too much sugar!

It is most likely the case that people don't even know that they are eating such large amounts of simple carbs. Most people consider fruit juice as a healthy option; however fruit juice, especially without the pulp, is mostly water and fructose – a simple carbohydrate sugar. If you think fructose is good for you and at the same time you think that table sugar is bad for you then please bear in mind that table sugar is actually 50% fructose (the other 50% is comprised of glucose). Simply put, fruit juice is fruit-flavored sugar water, not much different to just adding table sugar to a glass of water. The other factor that makes fruit juice pretty bad for health is the fact that it often contains the contents of multiple fruits in one glass – the sugar concentrations of fructose can be very high indeed and put a strain on the body.

The Important Points to Remember for us Gout Patients

- If you remember back to chapter one, we mentioned that sugar, particularly fructose, was a risk factor for gout. [342] [343] [344]
- Sugar, particularly fructose, is linked to higher uric acid levels. [345]
- The best way to get your energy from carbs is to eat complex carbs.
- Reduce your simple carbohydrate intake to a minimum.
- Table sugar is 50% fructose – eat less of it.

- Many food products have extra added sugar in them to make them more palatable, use appendix 3 to help recognize them on your labels and make some good choices.
- The main issue for table sugar, fructose, or other simple sugars is the blood spikes. Choose low-GI for better health outcomes in the long term.
- Fruit juices without the pulp have no good fiber in them to help the microbiome deal with some of the effects of the high sugar content. If you drink fruit juice, make sure to get it with the pulp.

Finally, many products have added sweeteners like high fructose corn syrup (HFCS). HFCS is likely to be extremely damaging to health and there is a lot of research that has accumulated over the years to implicate it. Please check out appendix 4 at the back of the book for an interesting discussion of HFCS where we list many of the associated bad health outcomes. It is quite a shock to see just how dangerous HFCS can be.

The Optimum Diet for living without Gout

Along with restoring balance to our gut microbiome, eating an alkalizing diet turns out to be low in purines and anti-inflammatory too. Being mindful about eating low glycemic index foods not only helps to free you from gout but dramatically reduces your risk of developing diabetes, obesity, and cardiovascular disease too. Once you adopt an anti-gout lifestyle then you receive the benefit of living in optimum health as you mature through life.

This is **good news** because we do not have to suffer from increasingly painful and limiting attacks of gout for the rest of our lives … we can just view ourselves as being lucky that we are being told so clearly by our body what it does and doesn't need for it to be healthy and agile regardless of our age! Stay tuned …

An Alkaline Diet is the Best Anti-Gout Diet

Researching for the perfect anti-gout diet allowed us to see that there is a lot of confusion about what an anti-gout diet should be … recently we have seen a change in the gout conversation away from eliminating purines as the sole cause of gout to using a multi-pronged approach to address gout as an expression of chronic inflammation. Of course, limiting purines in our diet prevents us from adding to the problem but there are many more factors that are generally involved.

One of these factors is that uric acid levels are affected by acidic or alkaline properties of all foods. What we know is that gout flourishes in an acidic environment (Low pH) and is hardly found in an alkaline (High pH) body.[346]

We also know that chronic inflammation is reduced by keeping a healthy balance between acid and alkaline foods that we eat. Scientists recommend that we should be eating 3 portions of alkaline foods alongside 1 portion of acidic foods – a simple 3:1 ratio. Our ancient ancestors apparently ate this way and only with the advent of modern industrial, agrarian and

commercialized approaches to food has our diet become extremely acidic and toxic for our health[347].

Eating a diet brimming with vegetables and fruits causes speedy elimination of uric acid whereas a highly acidic diet increases our urine's acidity and this makes it harder to get rid of uric acid.[348] This is great news for gout sufferers because they can alter their lifestyle choices to manage, prevent and reverse gout without resorting to pharmaceutical interventions. Simply choosing to eat an alkaline diet that is mostly purine free, gives us freedom from gout.

Animal proteins containing high levels of purines along with sulfur amino acids tend to create very acidic urine and is why anti-gout gurus recommend a vegan lifestyle with complete avoidance of all animal foods.[349] We agree that if you are having a nasty gout attack then it is best to avoid all animal proteins and plant foods with high purine content for the duration of the attack and for at least 3 - 6 months after.

Permanently restricting proteins from our diet may be too extreme if we consider recent research findings – we get the same or often better health results when we eat a healthy balanced intake of 75% alkaline promoting foods together with a maximum of 25% acidic foods. The results show that this approach improves uric acid elimination better than a low purine diet does.[350]

Don't be surprised to discover that what you normally think of as being an acidic food is often not the case once our bodies have metabolized it. Just think of a lemon – most of us would consider lemon to be acidic but after we have digested the lemon, it has an alkalinizing effect in our body.

It's important to understand that when our urine is highly acidic then uric acid is not able to be eliminated in our urine and this is where many gout problems begin! It is easy to correct this problem by simply eating an alkaline-rich diet.

Below we have listed some examples of highly acidic culprits that lower urine and blood pH levels:[351]

- Coca-Cola (pH = 2.0)
- Beer (pH = 2.5)
- Coffee (pH = 4.0)
- Products grown with pesticides or herbicides
- High Fructose Corn Sugar (HFCS)

Mineral ions like potassium and calcium both support an alkaline environment with pH measuring around 14. Magnesium is another vital mineral that is also alkalizing with a pH = 9. It is really clear that our bio-suits work best when we balance our ratio of alkaline to acidic food when we eat.

Another interesting factor is that the way food is prepared and the type of foods we combine together can also affect the pH nature of a meal. This means that we can increase the acidic or alkaline properties of a meal through our recipes and in the type of cooking method we use to prepare our meals. We can choose food recipes that use mostly alkaline ingredients that are combined together with a small portion of acidic products to make our meals.

Food Preparation is vital

The best way to benefit from our foods is to eat raw, whole organic products like salads or fruit and vegetable smoothies. When we heat our foods we lose nutrients and alter the nature of the foods we are eating. Increase the number of raw foods you eat by investing in a blender and then incorporating highly nutritious smoothies into your daily world. Once you start you will have so much more energy and vitality that you won't want to stop.

If you need to cook then the best methods are steaming and stewing. Avoid microwaving, baking, frying, barbecues or smoked foods.[352]

What about Fats?

Some vegetable and nut oils are prized for their highly nutritious profile and are essential to a balanced pH diet. Remember that most oils are acidic, so you need to choose healthy fats that contribute to the acidic portion of your diet.

For several decades we have learned that saturated fats are bad for us but recently health experts have revised their view – butter, for example, is no longer a bad choice but margarine is the new health gangster! Whilst saturated fats may trigger inflammatory cascades in the body, they are no longer viewed as the prime villain causing cardiovascular disease and high cholesterol levels.

From a gout point of view butter, milk and cream have very little purine content but may still aggravate inflammation in the body – now and again would seem to be a healthy approach.[353]

What we now know is that healthy fats are necessary and should for up to 30% of your diet. We recommend ghee, olive oil and coconut oil for cooking. Occasional use of butter is also acceptable. Oils found in nuts and some vegetables are also healthy for us in moderation because they provide super nutrients although in gout patients they need to be restricted because they are also acidic. The best nuts are raw and unsalted and include walnuts, almonds, hazelnuts, macadamia, pistachio and Brazil nuts. Eliminate cashews and peanuts, which are discussed under the lectin section.

What we need to avoid when it comes to fats are most commercially prepped oils that have been exposed to high heat processes. This causes trans fatty acids also known as hydrogenated oil products, which are extremely harmful to us and dramatically raise inflammation in our bio-suits.

We do need to avoid very fatty meals as this causes more uric acid metabolites to be re-absorbed and circulated around the body instead of eliminating them in the urine.

What about carbohydrates?

A typical scenario that presents itself to us on a daily basis, are foods that are high in fatty acids and sugar… Together they produce continuous negative effects that accumulate in various body tissues and pave the way for more serious issues to develop in the future.

Accumulation happens over our entire life so that by the time we start maturing we generally have a chronic lifestyle disorder unless we skill up and change our food habits to work in a healthy way with our bodies.

What we have learned so far is that we need to limit simple sugars (refined and processed) and increase complex carbohydrate foods into our diet. A convenient way to do this is to choose alkaline foods that have a low glycemic index as this takes out all the guesswork. Naturally, we want to eat moderate levels of starchy foods and instead focus on increasing our intake of fiber-rich carbohydrate foods to support our gut microbiome.

We need to take care of our gut microbiome and make sure that we encourage healthy beneficial bacteria that can support our body to eliminate uric acid. If we prevent gangster microbes that promote gout and instead encourage healthy beneficial bacteria to populate our gut, we enable our intestines to eliminate 30% of our uric acid load, safely and naturally. Restructuring our gut microbiome is critical for successful reversal of gout conditions and leading a life that is free from this painful condition. How do we do this? We simply eat loads of fiber-rich complex carbohydrates daily and ensure that we drink enough mineralized waters too – truly a recipe for wellness.[354]

Carbohydrates, sourced from eating organic, non-genetically modified fruit and vegetable whole foods, encourages the body to get rid of urate via our urine and through the intestines. Plenty of these low glycemic foods eaten daily begin to regulate the uric acid cycle bringing it back into balance.

Warning about High Fructose found in commercial foods and drinks ….

High fructose content in food or beverages - is a risk factor for obesity, diabetes type 2 and gout

Scientists already know that fructose-rich drinks are strongly associated with hyperuricemia[355], high blood sugar levels, lower uric acid excretion in urine[356] and an increase in the number of people who also suffered from metabolic syndrome[357].

What beverages are good in an anti-gout lifestyle?

Naturally drinking plenty of alkaline mineral waters is a wonderful way to ensure a successful healthy anti-gout diet.[358]

Drinking fruit and vegetable smoothies are excellent for optimal gout-free health.

Green Tea and other herbal teas are also extremely beneficial.

The worst offenders that are completely off-limits are alcohol (especially beer), commercial fruit juice and sweetened soda beverages.

Why drinking alcohol causes nasty gout attacks[359] [360]

- When alcohol gets digested by our body it creates lactic acid and lowers the pH of our body fluids making them more acidic. This causes uric acid to crystallize into deposits.[361]
- Alcohol also causes our liver to make more purines and this increases the production levels of our uric acid too.
- At the same time, because alcohol itself is packed with purines, it also increases uric acid production even further. Beer, for example, contains huge amounts of purines – in 500ml beer, there is about 170mg uric acid = 71mg Purines.
- The net effect is that uric acid is unable to be excreted and instead deposits of crystallized uric acid are placed around our joints.

It's not a pretty story …

Probably the quickest way to trigger a full-blown gout attack is to drink beer with fatty foods as they would increase each other's ability to promote gout.

On the brighter side …

You may be pleasantly surprised by the results of a study where researchers set about to answer the question of whether all alcohol is equally as disastrous when it comes to assessing gout risk.

What they discovered was that all alcohol **except** wine dramatically increased the risk of gout. This news may prove to be a blessing for gout patients who could enjoy a glass of wine now and then.[362] Other studies have not shown the same results but do report that the risk of gout increases dramatically with the amount of alcohol consumed. For example, the risk almost doubled when people had more than 1 alcoholic beverage even occasionally.[363]

Being aware of these contradictory research results allows us to proceed with caution when it comes to wine. Once you have embraced the anti-gout lifestyle and can hardly remember when you last had a nasty episode then it may be possible to enjoy a rare, occasional glass of organically produced red wine.

We recommend red wine because we know that is loaded with resveratrol, an exceptional polyphenol that is a potent antioxidant.[364] It has the ability to help shed fat and with a little exercise can help to increase a lean muscle profile too.[365] Multiple studies have shown that this natural nanotech is able to extend lifespan[366] too – we can't imagine who wouldn't feel excited to have a glassed bouquet of red grapes lead the way to longevity!

Of course, you could just choose to regularly eat dark grapes (organic cultivars with seeds intact) and benefit directly from resveratrol. Multiple papers have shown that procyanidins found abundantly in grape seeds and skins have a strong impact on reducing uric acid levels through

blocking xanthine oxidase.[367] Grapes also reduce pain by reducing specific inflammation pathways that affect patients during an acute gout attack.[368]

Managing Pain with Cherries

Not only are cherries delicious treats but they are also highly medicinal when it comes to reducing gout risk and more excitingly when it comes to managing pain during a nasty gout episode. Research has shown that eating 227g daily for 3 months, completely balanced uric acid levels and naturally reducing the incidence of gout attacks.[369]

Their pain-relieving properties are similar to non-steroidal anti-inflammatory drugs that block enzyme systems (COX1 & COX2) and mop up free radicals that release pain chemicals in the body.[370]

Other awesome medicinal polyphenols[371] that reduce gout and inflammation found in cherries include:

- Anthocyanin
- Hydroxycinnamate
- Catechin
- Chlorogenic acid
- Flavones
- Melatonin

Cherries are real superstars for gout sufferers – make sure you have plenty of these medicinal treats on hand.

Anti-inflammation interventions that work

When it comes to gout, we would expect to find promising research that looks at the effects of different anti-inflammatory nutrients on this disorder. After all, inflammation is a definite characteristic of gout attacks and sustained chronic inflammation has been linked to periods between gout flareups.[372] Surprisingly there is very little research on this topic but what we did find is exciting to share here.

Antioxidant-rich nutrients that work well to decrease joint inflammation and inflammatory molecules are an important feature in preventing gout attacks.

Key findings showed that curcumin spice relieved joint inflammation[373] as well as the potent polyphenol resveratrol[374] that is found in most berries.

Of course, omega-3 fatty acid (EPA)[375] and omega-6 GLA both deserve special attention in an anti-gout protocol because they reduce uric acid crystal formation.[376]

Fish are loaded with these powerful antioxidant treasures and sadly also contain loads of purines, which is why it is recommended that these natural potent chemicals be included in an anti-gout

program as supplements.[377] These supplements are best taken over a longer period of time than it takes for the average duration of an acute gout attack, which is usually over within 10 days. We recommend these supplemental products be taken for a minimum of 6 months and maybe longer to benefit from their long-term effects.

Lectins can wreak havoc in the microbiome[378]

Vegetables from the Deadly Nightshade plant family (Solanaceae species) can trigger allergic symptoms and inflammation in some people.[379] This is because they contain high amounts of lectins (See Below and in Chapter ???). Although alkaline, veggies such as eggplants, potatoes, aubergines or tomatoes are better eliminated from your diet until your gout is a distant memory.

Remember to eliminate lectins too as these are known to cause inflammation in the gut and dysregulate the gut microbiome, which is exactly what we want to avoid.

Lectins are in cashews, peanuts, beans (legumes), grains and peanuts are the most important to eliminate in addition to the deadly nightshade vegetables listed above.

Since inflammation underlies all gout stages it is important to eliminate all triggers until you have a healthy body back in balance. At this point, you can introduce a new food weekly and assess how your body responds to each food. This allows you to fine-tune your diet and lifestyle to suit you perfectly.

Best time to eat dinner

It's a good idea to eat your last meal at least 3 hours before going to bed so that you prevent uric acid accumulating in your body.[380]

Eliminate food items that negatively affect uric acid levels[381]

Examples of Items to Eliminate	
Bone and meat stocks Broths Offal Cold meats Smoked foods Canned Meat & Fish Canned foods in general	
Fish from the *Clupeidae* family	Sardines Sprats Herring
Cheeses	Processed cheese Blue cheese Rennet cheese High-fat creamy cheese
Animal fats	Suet Lard Bacon
Corn Sorrel Spinach Rhubarb Chocolate Marinades	
Hot Spices	Chili peppers Mustard
Alcohol Coffee Black Tea Cacao	Moderate intake only Contradictory research

Limit High purine foods until you no longer suffer from gout[382]

Meat & Fish		Legumes		Fruit & Vegetables	
Chicken	175	Mung Beans	222	Raisins	107
Veal	172	Soy Beans	190	Broccoli	81
Salmon	170	White Beans	128	Artichoke	78
Pork	166	Lentil	127	Leek	74
Turkey	150	Garbanzo	109	Apricot	73
Shrimp	147	Green Peas	84	Brussels	69
Duck	138	Bean Sprout	80	Dried Plum	64
Venison	138	Tofu	68	Mushroom	58
Scallops	136	French Beans	45	Banana	57
Beef	133	String Beans	37	Spinach	57
Rabbit	132			Corn	52
Lobster	118			Cauliflower	51
Mussels	112			Cabbage	37
Cod	109			Grapes	27
Oysters	90			Asparagus	23

Foods with lower levels of purines under 50mg can be eaten sparingly …

All of these different pieces of the puzzle work together to ensure that you eliminate more uric acid in your urine and increase your effectiveness in making a truly healthy anti-gout diet change.

Remember this is a change of lifestyle, not a fad diet that you do for a while and then return to your previous habits. It is exactly your habitual tendencies that have led directly to having gout and left unchecked can ultimately result in collecting other degenerative disease diagnoses over time.

The real positive truth is that once we know how our body works and what we can do to enjoy a healthy active and energy-filled life then our health is in under our control. We need not be the victims of our biology, instead, we can confidently empower ourselves to lead the life that we choose – it's up to each of us!

Optimum Gout Diet: FAQ

Does one have to eliminate all proteins to be free from gout?

If you have not had a gout attack for at least 3 months then you may experiment by introducing a portion of lean free-range meat or wild-caught fish not more than 3 times per week. One portion needs to weigh less than 100 g so that uric acid levels are not raised excessively.[383]

A happy experimental result will also depend on having a healthy microbiome that is brimming with rich biodiversity. You need to be a 'five stars' host and daily eat enough prebiotic foods (fiber) to keep your 'inner tribe' happy. If your microbiome is full of healthy microbes then they will produce nearly all the B vitamins and vital nutrients we need to be energetic and physically healthy! It seems like a very fair synergistic arrangement for all parties!

When should I restrict my purine intake?

Well, technically at all times … and definitely, if you are experiencing an acute gout attack. We caution moderation after you have stabilized your gout-free lifestyle for at least 3 – 6 months. After you have remained symptom-free with confidence then you may want to consider trying some purine-rich foods and observe how your body responds.

In an acute gout attack … All purine dense foods are off-limits

All Purine-rich animal products and vegetables should be completely eliminated from the diet during an acute gout attack. The body can't cope with the uric acid conditions it has, so adding other sources that increase uric acid production, as well as blocking its elimination makes no sense at all!

This situation can change once you are no longer experiencing acute gout flareups. Then you can slowly experiment with your diet by including a new purine-rich food into your diet on a weekly basis.

Haven't had gout attacks for a while and ready to experiment with purines?

According to the experts, we were not designed to take in purines that produce more than 500mg of uric acid daily. Surprisingly, the intake of milk and some dairy products, as well as fruit and vegetables have been shown to reduce the risk of hyperuricemia.

No-Purine Foods

- Butter – used in moderation
- Cream – used in moderation
- Honey

Low-Purine Foods

- Milk
- Rice – used in moderation as it is a starch
- Fruit
- Eggs

Not all purines are equal according to some researchers!

Interesting research has shown that some purines affect uric acid production more than others. We have 2 main purines (Adenine and Guanine) that are used as basic DNA building blocks. There are another 2 purines (Xanthine and Hypoxanthine) that make a temporary appearance whilst the main purines are made.

Below is a quick summary of these fascinating finds:

- Adenine & Hypoxanthine – highest effect on increasing uric acid levels = promotes uric acid formation[384]
- Guanine and Xanthine had far less impact on uric acid production.

One of the interesting anomalies that we discovered whilst researching this book is that vegetable purines did not appear to affect uric acid levels in the same way that animal purines do. Seafood, alcohol and fatty meat were the best indicators of high uric acid levels that predicted the risk of gout.[385] Surprisingly, eating lean meat was associated with lower uric acid levels.[386]

What this means is that moderate lean meat can be eaten in an anti-gout diet! We would recommend eating free-range skinless chicken breasts or very lean beef be included in not more than 3 meals per week. Each meat portion should be restricted to 100 grams per meal.

It would be great to have more large-scale studies to be conducted so that we can confidently include purine dense vegetables into our diet with impunity. In the absence of this type of evidence we would recommend including one new purine containing vegetable into your diet weekly but avoid those with really high purine levels that are greater than 200mg of total purines.[387]

What is meant when we say that moderate purines in the diet are acceptable?

It means that it is generally safe to eat foods (in 100 g portions) that contain less than 100 -200 mg of purines.[388]

We have compiled a comprehensive list of food purines at the end of Appendix 5 at the end of the book – it should allow you to personally fine-tune your diet according to purine content.

Different groups of purines have been used in the food lists to make it easier to find the foods that have high or low purine content. They are classified in the following ways:

Group		Content	Purines present in 100 grams of product
A	-	Very low	50 mg
B	-	Low	50 – 100 mg
C	-	Moderate	100 – 200 mg
D	-	High	200 – 300 mg
E	-	Very High	Above 300 mg

The causes of gout are now recognized as being far more complex than merely eating a diet loaded with purines … we now know that uric acid metabolism is also affected by quality (fatty vs lean) and quantity of proteins, the number of healthy fats and the acidic or alkalizing nature foods and drinks.[389]

Exercise, Stress, and Sleep

Stress, exercise, and sleep are all deeply intertwined. If we are chronically stressed we are likely to have problems sleeping. If we have problems sleeping we are not likely to have the energy to exercise or the motivation to. If we don't exercise we may have problems getting to sleep too. If we don't exercise then we are likely to be more stressed.

Sleep, exercise, and stress, intertwine together to influence our health. An imbalance in any one of these factors will pull the others out of balance too. For gout patients who experience chronic low-grade inflammation in intercritical periods, these factors are really important. During painful gout attacks, the body comes under severe stress, and sleep is often disrupted terribly. Most people can't exercise at all during gout attacks, so these factors are very relevant during attacks too.

Let's explore the roles that exercise, sleep, and stress play in our health so that we can effectively adopt great strategies to keep these things supporting our health.

Exercise

Regardless of whom you are, how healthy or sick you may be, exercise is universally acknowledged to be beneficial to health. There is no debate about whether exercise is beneficial, none at all. But, there is some debate about what kind of exercise might be best, or what kind would be best in certain situations, with different people. For example, if you are young and reasonably healthy, then any exercise will probably be beneficial. However what happens if you have a heart condition, or you have arthritis, or gout, or diabetes? It is when people are sick, old, frail, or at risk that the question of exercise becomes a bit more subtle and difficult to answer.

The first consideration for people with gout is whether they are up to exercising when they are having a gout attack. The truth is that during gout attacks most patients wouldn't be up to exercising because they would be in too much discomfort and pain. However, what kind of exercise might be good for gout patients in the phases of gout between attacks? Here, as in most other situations where a patient is at risk, the research seems to indicate that moderate and sensible exercise three to five times a week would be best.

Consider people with heart problems. Opinions often differ on whether to 'push it' to strengthen the heart or relax with more gentle exercise to not tax the heart and lungs too much. The truth for cardiac patients is that they seem to benefit best, on average, by doing moderate low-intensity exercise sessions each week (30 minutes of low to moderate exercise 3 to 5 times a week). The same strategy could be recommended as a minimum recommendation to gout patients. We don't want to overly tax the body, but we should be doing exercise in some form to reap the benefits (described below) – and there are significant benefits.

How beneficial is exercise exactly?

When we exercise, we raise our heart rate, temperature, and circulate more oxygen throughout the body. Increased oxygen levels generate increased energy (exercise actually helps to generate energy), and helps to repair our mitochondria and the metabolic mechanisms that produce energy.

Improving mitochondrial health and regenerating mitochondrial based metabolic systems *improves every single system in the body!* All at once, in one shot, we can improve our total health and wellbeing simply and decisively. Amazingly, when our mitochondria function optimally then they are able to take toxic free radicals out of our tissues and convert them into energy – could there be anything more beneficial?[390] [391] [392]

Aside from better oxygenation, improving blood flow and raising temperature serves to effectively move metabolic by-products (and waste products) out of problem areas. Sweating is a good example of the supreme efficiency and intelligence latent in the body. Sweating keeps us cool when we are hot, but the body also eliminates waste products in sweat – nothing is wasted, ever.

The by-products affected by exercise can include plaques in our arteries and veins, lactic acid, free radicals, allergens (particles that induce immune reactions and inflammation), and many more. [393]

Insights generated by research into exercise have discovered that exercise releases cytokines like interleukin-6 (IL-6). IL-6 transforms carbohydrates into glucose, reduces tumor growth rates, and stimulates the production of anti-inflammatory cytokines, as well as aiding in the breakdown of fats. Too much IL-6 in the body is associated with lipid aggregation (not great for the heart) but this effect is always more than adequately offset by the increased removal of waste products from the body. Also, the amount and intensity that exercise needs to be in order to be called "too much" is pretty substantial. This is why we recommended a sensible, moderate, and regular exercise regime.[394]

Exercise definitely improves the blood vessels and circulatory system as a whole. [395] Not only does exercise improve basic biological functioning, but time and again exercise has been linked with better cognitive performance – people who exercise think better. No one single mechanism has been linked to the increase in cognitive function, instead, the increased mental benefit is thought to be the due to a total improvement in multiple factors affecting brain function; factors like better blood flow, readily available energy and a diminishment in factors contributing to brain damage.

Consider it from this angle, if your body is efficient, energy sufficient, and waste product free then it is likely that your wakeful states of consciousness would be perfused with greater clarity and attention.[396] [397] [398] [399] Excitingly, exercise aids in the growth of new nerve cells and thus

supports our ability to make new nerve connections in the brain (a phenomenon known as ”neuroplasticity”.[400]

Actually, it turns out that moderate exercise for 30 minutes a day 3 to five days per week confers multiple benefits; here is a brief list of some of them:

- Good for treating heart health and preventing heart disease[401]
- Protects against the onset and progression of various form of cancer[402]
- Protects against the onset, progression, and symptoms of diabetes[403] [404]
- Prevents obesity and helps to maintain optimal body weight[405]
- Reduces our risks for Alzheimer's disease[406] [407]
- Protects us from Parkinson's disease[408]
- Really helps us sleep better, protecting against insomnia[409] [410] [411]
- Helps with just about every other ailment you could think of.[412] [413]

What Kind and How Much Exercise?

Generally speaking, exercise is thought to be maximally beneficial when: [414]

- It is done regularly as opposed to now and then (erratically).
- Low intensity or moderate-intensity exercise is usually healthier than very high-intensity exercise because it is easy to overdo high-intensity exercise and suffer some of the few negative consequences.

Doing absolutely no exercise will leave the body without any of the benefits of exercising. But, in addition to losing out on the benefits, doing no exercise (or engaging in a mostly sedentary lifestyle) will actually actively contribute to disease and degenerative conditions.

So, just to put it really simply, you should exercise according to your current level of fitness - doing 15 to 30 minutes of exercise three to five times a week will provide immense benefit for any of the conditions mentioned above, including gout.[415]

More recently, research has been emerging showing the benefits of high-intensity interval training (HIIT) for health, particularly for heart health. HIIT training involves very short bouts of intense exercise where you go ‘all-out’ (30 seconds to a minute long), interspersed with longer periods of low to moderate activity so that you can recover. HIIT sessions have been shown to be effective even when as short as 12 minutes. However, the typical session length is between 20 and 30minutes long. In most cases, HIIT has so far been shown to be reasonably safe and highly beneficial for heart disease patients. So, if you prefer getting a full health beneficial workout in 20 minutes or less, then HIIT may be the way to go. Research into HIIT is still quite new, but the results are solid and seem promising.[416] [417] [418] [419] [420]

Resistance training is another form of exercise that tones the body while also giving you full control over your exercise intensity. Just realize that a gym membership is never really

necessary, you can safely use the resistance of water in a swimming pool to exercise and tone muscle. Furthermore, simply going through a gentle stretching and posture routine every day on a towel in your home can also do what is needed – so, you don't need to spend a ton of cash on gym memberships unless you would like to have the benefits a gym can offer – up to you.

Another excellent way to engage with exercise is to take up some form of martial art – though you should take care to choose a martial art suited to your mental and biological disposition, you don't want to push it to the point where you start seeing the negative effects of exercise.[421]

Specific Exercise Considerations for People with Gout

It probably need not be mentioned, but if you are experiencing a gout attack then don't worry about exercising. Most people who are in an active phase of gout are just in too much pain and discomfort to be able to exercise, let alone to be able to enjoy or even want to exercise.

It should be clear that exercise is way too beneficial for health and quality of life to not do some each week. However, exercising just for health is not the only consideration. There are many activities and hobbies that involve low to moderate-intensity exercise that are also extremely fun and enjoyable.

There are two factors to really keep in mind when you choose the kind of exercise you would like to do as a gout patient. The first factor is that in gout, there is always some kind of low-level chronic inflammation in the body, even during intercritical phases between gout attacks, especially so. The second factor to keep in mind is the little deposits of urate crystals in joints.

Why are these factors important to your choice of exercise? Having low-grade chronic inflammation means that gout patients should never induce extra unnecessary, or voluntary, inflammation. This means that one should never do excessive levels of exercise because this will increase the general state of inflammation in the body. Moderate or low-intensity exercise will still increase your inflammation somewhat, but the benefits in these cases will far outweigh the risks.

Regarding the presence of crystals in joints, and general joint health, gout patients would be better served by doing exercise that has minimal impact on the joints. This is because we should try to prevent the urate crystals from shedding into the joint fluids and spaces. This means that we should try to avoid jarring the joints with impacts. Examples of exercise activities that can jar the joints include jogging/running (which puts impact on the feet, ankles, knees, and pelvic joints), contact sports like rugby, football (American), wrestling, boxing/kickboxing, and some martial arts that are combat-oriented and competitive (joint holds in aikido for example).

So, given the above considerations, some of the best forms of exercise you could choose would be walking or hiking in nature, cycling (very low impact on the joints), and swimming – there are many more good options so definitely find one that works for you.

One final point worth noting is that temperature matters to gout patients. Recall from chapter one that low temperatures in the joints can actually induce gout attacks independent of hyperuricemia. So, we should try to keep our vulnerable peripheral joints warm. This has some importance for certain exercise activities. Take swimming as a good example, swimming is a fantastic exercise activity, it is low impact, fun, can really build muscle, reduce weight, and refresh our energy. But, for gout patients, swimming is probably best in a heated pool or at least a pool that is not really cold. Other examples where cold might be a factor is exercising outdoors in snow or cold climates or playing ice hockey, etc.

One good thing about exercising, at least as far as temperature is concerned, is that exercise raises body temperature. So, if you do exercise in a cold environment, just make sure to warm up properly before starting anything vigorous. In fact, it is a good idea to always stretch, warm the peripheral joints, and raise your heart rate a bit before starting any exercise, not just before entering a cold pool or some other cold environment. It is also always a good idea to 'warm down' at the end of your activities. Just do some stretches and deep breathing at the end of an active session to bring your heart rate down slowly and oxygenate the tissues – this will prevent muscle cramps and soreness and protect the heart.[422] [423] [424]

The consideration of cold temperatures in affected joints as a big risk factor for gout attacks is also very important during gout attacks, or exercise injuries. Some health authorities and health websites actually recommend putting ice packs on painful sprains.[425] Now, this is probably one of the worst things a gout patient could do. The benefits of cold packs are that in the short term the cold will numb feeling in an area and help with pain and some swelling, but it will also cause more urate crystals to be deposited in the joint space. The main cause of all the pain and suffering during a gout attack is the immune system responding to gout crystals that have shed in the joint space, so cold packs are likely to just make the gout attack last longer and get worse. So, if you do get a joint sprain, or a gout attack, better to ease off on exercise, keep the joint warm, and avoid dropping the temperature completely, don't take any advice to the contrary, no matter who says so.

Ultimately, exercise can be fun. Exercise does not have to be a chore in the gym that you have to do to stay healthy. Consider going for long walks in nature, taking up bird watching, cycling, surfing, or another active outdoor hobby that really enriches your life.

Stress

Most people think of stress as a purely psychological phenomenon. While it is true that stress is often experienced subjectively in a psychological way, it turns out that a large component of stress happens in the body, at a chemical level.

The body comes under stress from all kinds of stimuli, not just psychological cues. Examples include whenever the body suffers pain or damage, or long periods of high physical demand, or long periods without sleep, poor nutrition, infection or disease, or even stressful psychological

events like the death of a close family member, divorce, or being in a life-threatening environment with predators or other human attackers.

Ordinarily, the human body is able to cope with acute physical or psychological stressors (things or stimuli that induce a stress response in the body). Acute stressors are sudden, short-lived and can be extremely intense. Unfortunately, the human body is not that skillful at managing chronic psychological anxiety nor is it very good at handling chronic physiological stress that persists at a low intensity over long periods of time.

Basically, chronic unrelenting low-grade psychological stress (not to mention chronic levels of extreme stress) has many adverse effects on the body. Examples of negative effects on our health include high blood pressure, dementia, depression, chronic inflammation, and an increased chance of developing many different kinds of cancer.[426] [427] [428] [429] [430] [431] Stress is a ubiquitous problem; two out of every three visits to the doctor are usually related to stress and anxiety and the serious health complications that can arise from that stress.[432] [433] [434]

While chronic stress creates significant bad health effects, conventional medical approaches to managing stress often rely heavily on psychoactive pharmaceutical drugs to deal with symptoms. Furthermore, mainstream stress management strategies usually fail to rebalance biochemical abnormalities like unbalanced adrenal gland hormone levels. Without addressing the underlying imbalances in the body, how can conventional approaches really hope to achieve any healthy and sustained stress relief? [435] [436] [437]

The main biological consequence of unrelenting chronic stress and anxiety is a complete disruption of what is called the "hypothalamic-pituitary-adrenal axis" or the HPA axis for short. What is this so-called "axis"? Well, the adrenal glands are responsible for secreting adrenaline which activates our body in preparation for fighting or running away (fight or flight response). The pituitary gland is like the master controller gland and acts to regulate the responsive mechanisms and switch them on when needed and switch them off when not needed. Basically, the HPA is an interconnected network of biological signaling mechanisms and they tightly communicate with each other and closely regulate the production of our stress hormones.

Chronic stress basically leads to a sort of desynchronization of the HPA axis system which imbalances our stress hormones – leading to chronic stress, fatigue and all the other problematic side effects of long term anxiety.

Chronic Stress Has Deadly Consequences

An example of what we mean by 'deadly consequences' is a stress caused physical problem called cardiomyopathy (a weakening of the heart that happens suddenly and spontaneously) and people begin to develop odd arrhythmic heartbeat patterns – this often results in sudden death due to heart failure – heart failure caused by unbalanced elevations in epinephrine (adrenaline) which over-stimulates the heart muscle – over time this stimulation causes the heart to change

structure and shape and leads to heart muscle death – a chilling example of stress-related health problems.[438] [439]

There are many such complications that can be caused or made worse by chronic stress like the striking condition called Karoshi (in Japan) which is stress-related death due to overworking. First observed in post-world war II Japan, overworked and emotionally and physically overwrought Japanese top-level executives repeatedly dropped dead from sudden strokes and heart attacks – due to stress-induced problems with the HPA and the brain and heart being affected thereby. Amazingly, in 1990 the Japanese government estimated that as many as 10 000 men were dying every year due to "Karoshi" – what a horrifying prospect.[440] [441]

Ok but these consequences are rather rare, yet they do show the possibility of extreme danger. In our context, the issues that give rise to gout, and gout associated problems are what is important. Unfortunately chronic stress can give rise to all of them.

Prolonged stress has been linked with increased inflammation, increased thickness of the inner linings of blood vessels, increased anxiety and depression because of stress-related structural and functional changes in the brain. [442] [443] [444] [445] Finally and quite importantly, those who do not properly manage and adapt to chronic stress are much more likely to eat poor quality convenience foods high in inflammation-causing additives, high in inflammation-causing omega-6 fatty acids, and high in sugar, often leading to obesity, sexual dysfunction, microbiome problems, hyperuricemia, gout, and a whole bunch of other associated issues.[446]

A summary of some of the health risks due to sudden and acute, or chronic and poorly managed stress and anxiety are listed briefly below:

Thing that causes stress	Increases risk of what problem?	What is the increased risk?
Sleep Disturbances[447]	Early Death from any cause	+170%
	Occupational Injuries	+38%
	Early Death from any cause	+32%
	Death from Respiratory Disease	+79%
	Death from Heart Attacks	+159%
Perceived Stress[448]		+207%
	Death from External Causes	+491%
	Suicide	
Adverse Childhood Experiences[449]	Death by Age 65	+140%
	Risk of Type 2 Diabetes in Women	+100%
Stress at Work[450] [451] [452]	Death from Heart Attack	+181%
Major Negative Life Events[453]	Early Death from any/All Causes	+65%

The Normal Body Response to Stress

Given a stressful stimulus, the body begins a complex system of reactions to help adapt and cope with the stress. This response results in the release of glucocorticoids (stress hormones), and catecholamines, which both stimulate responses and changes in many bodily systems designed to adapt to situations effectively.

Fight or Flight

In extreme danger or frightful circumstances, the body initiates a fight or flight response which prepares the body to meet the perceived threat and survive, at all costs. Priming the body for extreme exertions to outrun or fight off danger requires immense energy so blood flow is directed to the muscles, blood pressure is increased to ensure plenty of good oxygen and nutrient energy circulation. Sugar is dumped into the blood and the pupils dilate to presumably let more available light into the eye. Digestion grinds to a halt (an important issue for IBS) to conserve energy for the main priority of survival in the immediate present moment. These are the pure symptoms and signs of a flight or fight response at the physiological level. The whole response

can be seen as one unified whole that gets initiated by the brain and then cascades to affect all the different body systems to prime the body for an intense period of survival.

Interestingly, it is the brain's apparent perception of stress (usually not a matter of conscious reasoning) that causes the whole response to be initiated by the hypothalamus – the hormonal messenger molecules secreted by the hypothalamus activate the adrenal glands and ultimately the gland. This is the essence of the HPA axis that was mentioned in an earlier section.

The adrenal glands upon receiving the appropriate signals from the hypothalamus begin to secrete stress hormones and catecholamines which then spread throughout the whole body, signaling cells and blood vessels to 'wake up' and make the appropriate changes to prepare the body for flight or fight.

The flight or fight response is appropriate and necessary in cases of extreme physical personal danger or the danger of loved ones like children. However, because the whole process is started by a perception of a stimulus as threatening and dangerous, the brain can make mistakes and overemphasize modern stimuli in the workplace or at home as dangerous. In essence, the plague of modern stressful lifestyles basically refers to a slightly out of control protective mechanism that served the human being in the past as an evolutionary safety mechanism – if this mechanism runs out of control in a modern context due to modern stressors, then it can have damaging effects over the long term. Consider that the body is bringing to bear a vast amount of resources and pushing its apparatus to the maximum in order to give you the best chance of survival. This response is useful when defending against a tiger, but not so useful when a car suddenly honks its horn and gives one a fright, or the perception of imminent possible danger on a city road during high traffic. Day by day the body can wear itself out and damage its heart, blood vessels and overtax the brain and mental faculties. Modern stressful living can trigger a baseline stress response that remains chronic and debilitating – this can definitely contribute to many dangerous problems, not least of which are digestive disturbances, abdominal pain, and chronic levels of suffering.[454] [455] [456]

Cortisol is the Hormone to Watch

Cortisol is both beneficial and dangerous – a paradoxical hormone in many ways. On the one hand, a small amount of cortisol is necessary for perfect optimal health, but too much or too little can be a total disaster – especially over the longer term.

During strong and sudden episodes of stress, more cortisol is released to help the body cope.[457] The main functions of cortisol are to regulate blood glucose (tells the liver to dump sugar from storage into the bloodstream); to regulate the immune system and its activation, and lastly, to regulate our metabolism (the processes the body uses to form energy from food and nutrients).

So cortisol is definitely a player in our digestion and metabolism and our psychological states of being – it is, therefore, important to keep cortisol in a good balance so that we do not allow stress

and cortisol to contribute to poor health. In the face of chronic psychological stress, the adrenal glands release an abnormal amount of cortisol into the body in an abnormal rhythm.

Cortisol activates the immune system. This means that stress, via cortisol release, can contribute to inflammation – this is precisely what happens when too much cortisol is released in an unregulated way. Interestingly, cortisol can suppress the immune system as well, which leaves us vulnerable to infection or inappropriate invasion in the gut – a huge factor in the health and composition of the microbiome which is of importance to gout patients.[458] [459] [460] [461] [462]

Another reason cortisol may be linked to digestive system functioning is that receptors for cortisol exist in all parts of the body and not just in the brain alone – so a disruption in cortisol regulation and secretion will disrupt multiple body systems, like the gut, heart, and immune system, not just the brain.[463] [464] [465]

Overwhelmed by Stress? How to recognize the biological signs?

There are three states the body faces when dealing with stress. The first is sometimes referred to as "the alarm state" which is early in the process. Alarm states are followed by "the resistance state" which is where the body attempts to adapt to the perceived added stress (basically releases cortisol). Finally, after stress overwhelms and weakens the system, people enter a third possible state called "exhaustion".[466] [467]

A good way to think of these states is in terms of physiological preparations, effects, and ramifications on the body. For example:

The Alarm state is an adaptation by the body to acute stress e.g. "fight-or-flight". The resistance state arises because of a constant state of alarm which has negative effects on the body. Finally the state of exhaustion which is characterized by an unresponsive HPA system, and so the body can no longer rouse itself in any meaningful capacity to deal with even day to day obstacles.

What follows is a list of symptoms associated with being overwhelmed or overtaxed on the HPA axis and stress response. If you recognize that you are experiencing chronic and dangerously high levels of stress, then the following symptoms will tell you if your body is managing to handle the stress or if you happen to be descending into resistance or exhaustion.

1. Extreme fatigue after minimal exertion; "overwhelmed" by minor problems or obstacles.
2. Unexplained trouble awakening in the morning – e.g. even after good quality sleep.
3. Having to rely on stimulants like coffee (caffeine) or other "energy" drinks throughout the day.
4. Your energy levels rise after 6:00 PM (noticeably) and you have a god burst of capacity compared to the rest of your day.
5. Persistent low blood pressure (Standing up often makes you feel weak and dizzy)
8. Depression and/or easily changeable moods/severe mood swings
9. Mental fogginess; bad memory

10. Poor sex drive
11. Chronic Anxiety (psychological)
12. Craving sugar and/or salty foods
13. Decreased general appetite
15. Chronic allergies

These symptoms are not necessarily unique to just stress-based exhaustion and damage, but can also be experienced because of alcohol abuse, disruption or dysfunction of sex hormones and/or the thyroid gland, malnutrition, chronic fatigue, and some others. Best to check in with your favorite healthcare professional to rule out some of these other possibly dangerous conditions before concluding that it is stress-induced only.[468] [469]

Chronic Stress & Nutrition

Our adrenal glands which are responsible for adrenaline release (and cortisol release) can be directly and indirectly affected by nutritional deficiencies, toxic products, and lifestyle behaviors. Good examples of this include the fact that vitamin C and vitamin B5 are required in the formation of cortisol – deficiencies in these vitamins will have a serious impact on our adrenal function.[470] [471]

On the other hand, ingesting or being exposed to too much copper can also damage or disrupt the functioning of our adrenal glands if levels are too high – copper toxicity/poisoning affects the stress response directly too.[472]

Minor mineral imbalances can also affect cortisol levels – for example, if our copper to zinc ratio is out of whack then the adrenal glands start to function in odd ways.[473] [474] So something as simple as a well-balanced multivitamin supplement can make sure that these types of disruption to the adrenal glands never happen – safe easy and simple to do. The functioning of our microbiome is also important for the proper absorption of nutrients from the diet.

In terms of diet, the fatty acid content of our diet contributes massively to stress physiology. Too many omega-6 fatty acids relative to the omega-3 fatty acids raise inflammation in the body which can certainly damage body systems, impair digestion, and bend the normal stress response out of shape.[475]

Making sure to eat enough fish oil, krill oil or cod liver oil alongside decreasing hydrogenated saturated vegetable oils can massively decrease all-round low levels of chronic inflammation and help to alleviate stress at a baseline physiological level.[476]

To put it simply, a diet high in omega-3 fatty acids reduces the impact of chronic stress by preventing excessive levels of inflammation in the body. Not only does this help stress, which helps gout, it also reduces inflammation, which helps gout further![477]

Simple Things we can do to Avoid Chronic Stress

Lifestyle modifications have shown success on their own at decreasing and helping with the stress response.[478] [479] [480] Of course, lifestyle factors and behaviors alongside dietary supplementation, hormonal balancing, and microbiome considerations will all complement each other tremendously. The best results with adrenal gland problems and runaway stress responses are likely to be seen with a comprehensive approach to lifestyle, nutrition, supplementation, exercise, and sleep.[481]

Some of the best lifestyle advice for overcoming stress is given below:

1. Try to avoid stressful situations and events until your body and mental state recuperate to a more healthy balanced state – one that is more able to handle stress and anxiety. Although this sounds obvious, it is actually really beneficial. Examples of what kinds of things really help include moving closer to work to cut down on stressful commuting in traffic. Avoid third shifts or graveyard shifts if this is messing with your sleep and causing damage and disease.[482] Other good recommendations include reducing smoking and reducing very intense, extremely vigorous exercise sessions which massively impact the adrenal glands in a very negative way.[483] [484] [485]
2. Try not to drink stimulants before bedtime e.g. caffeine, since this can stimulate the release of cortisol which can impair sleep and disrupt the body's natural evening rest cycle which it uses to recover from the stresses of an active day.[486] Notwithstanding the effects on cortisol, caffeine (and alcohol, though alcohol is pretty off limits for gout patients) can affect the release of melatonin, decreasing it. Melatonin is a natural hormone produced by the body to regulate sleeping/waking cycles and is responsible for the feeling of sleepiness at bedtime. Melatonin significantly counters certain aspects of the stress response as well as being beneficial for many inflammatory conditions because it is also a very strong antioxidant.[487]
3. Interestingly a whole bunch of other activities and therapies have been proven beneficial for alleviating the physiological stress response. Examples include acupuncture, Traditional Chinese Medical therapies, Ayurvedic medicine; massage therapy, relaxation, yoga, and music therapy. [488] [489] [490]
4. Having a pet is linked with much better physical and psychological health particularly for chronic stress. So besides being an absolute joy, taking care of a dog or cat really can extend your life and improve its quality (as well as extend and improve the quality of life of your pet too!).[491] [492] [493]

Fantastic Strategies to Manage Your Stress

Hormonal Balancing

DHEA

DHEA is the short acronym for a rather scary and complex-sounding chemical called "Dehydroepiandrosterone; de-hydro-epi-andro-sterone" and is in fact also an adrenal hormone that counters the action of cortisol in many different tissues all over the body.[494]

In our younger years, the relative balance between cortisol and DHEA remains in optimum ranges, however as we age, levels of DHEA tend to go down which means that, relatively speaking, cortisol levels increase – which means more stress and more gut disturbance; not good for our gout at all.[495]

So, the idea is to supplement with DHEA and restore an optimal working balance between cortisol and DHEA.[496] The effects of supplementing DHEA are many, varied, and beneficial. We list a few of the benefits briefly below:

Restoring DHEA or Supplementing with DHEA can:

- Reduce the negative impact of high levels of cortisol on the brain – especially in cases of dementia and Alzheimer's disease.[497]
- Maintain and protect the heart from heart disease.[498] [499] [500]
- For abdominal obesity (an important factor related to gout), fat metabolism disorders, insulin resistance (one of the key factors in diabetes), and high blood pressure (a key factor in heart diseases), DHEA lowers fatty tissue formation and reduces heart disease risks, and helps reduce the risks linked to obesity such as gout.[501] [502]
- Have a positive effect on your thinking abilities and moods.[503] [504] [505]
- Be beneficial for those with glucose intolerance and diabetes by lowering average blood glucose levels and preventing any damage due to blood glucose and/or diabetes.[506] [507]
- Reduce the risk of certain cancers.[508]
- Combats osteoporosis.[509]
- Fight unbalanced stress responses. This helps to prevent poor nutritional cravings, inflammation, depression, and anxiety – thus relieving some of the worst health factors surrounding gout and inflammation.

Melatonin

Melatonin is a potent naturally occurring health-promoting compound. As mentioned above, melatonin helps regulate our waking and sleeping cycles and help to make us feel drowsy at bedtime. Unhealthy and unusually low levels of melatonin can mean inappropriate and undesirable stress hormone signaling during the nighttime. [510]

The time of day where the body recovers from stress and repairs and rejuvenates is usually at night during sleep. So, chronic late-night stress, be it physical or psychological, can elevate night time cortisol levels which can completely shift the body out of a natural balance – this is classically the case with late-night shift-based work – shift work is an example of such a stressor.[511] This chronic disruption and inappropriate release of cortisol at night may impair the normal cycles of hormone releases in the morning.[512] [513] [514] [515]

Melatonin is also very good at getting inside of cells and acts as one of the strongest natural antioxidants we know of – which explains the fact that it can also protect and help maintain the optimal functioning of tissues, and keep our DNA in good shape.[516]

Melatonin has the ability to affect levels of cortisol in the body as well as impact the balance between DHEA and cortisol in blood circulation.[517] [518] [519]

Finally, melatonin is very safe and well-tolerated, effective dosages can be from as little 0.3mg per evening all the way to 15mg per evening depending on the advice of your clinician. It is often prescribed for jet lag.

Nutrients to Counteract the Effects of Stress

B-Complex vitamins

We already talked about the B vitamins in chapter three, but here again, we see the power of this family of vitamins to work together to support our health. Don't forget to remember that absorbing these B vitamins is very dependent on having a healthy gut environment. But, if you're getting enough absorbed, then your stress levels will decrease – which helps all with all health, including gout.

A few members of the vitamin-B family can affect our different stress mechanisms for the better. Pantothenic acid is required for making coenzyme A (CoA), an important component in the production of cholesterol, which is really important for the production of hormones i.e. stress hormones.[520] Pantothenic deficiency, therefore, results in what is called adrenal insufficiency, amongst other problems; although a deficiency in pantothenic acid is rather rare. [521] [522] [523]

In the scientific literature, there is an inverse relationship between injecting cortisol into the body and vitamin B12 levels – the more cortisol is injected the more vitamin B12 seems to get used up.[524] This result (and others) strongly suggests that a vitamin-B complex supplement should have significant effects on the healthy balance of stress hormones and thus also on the health of our gut environment, multiple body systems – really good for gout.

Vitamin C

Once again, this superstar celebrity vitamin rears its head – this time as a stress buster. Vitamin C is crucial for our adrenal glands and the maintenance of healthy levels of cortisol and

DHEA.[525] [526] Deficiencies of vitamin C have strong effects on our adrenal glands.[527] [528] The benefits of vitamin C are multiple, potent and beneficial.[529] [530] [531]

In terms of extreme and hectic exercise, which is known to put massive stress on the body raising adrenalin and cortisol levels, vitamin C given in doses of only 1500mg after the exercise resulted in more balanced stress hormone profiles. Vitamin C, therefore, dampens the negative stressful effects of extreme exercise such as running a long-distance marathon – an effect which may help prevent gout attacks because of the exercise activities you like to do![532]

Minerals

Calcium, magnesium, sodium, and potassium are all macro elements essential to the body's healthy functioning. These elements are macro-elements and not micro-elements because they are needed in larger quantities by the body. One of the main functions and purposes of these four macro elements is to balance the functioning of our adrenal glands – meaning that we are less stressed at a biological level and better able to handle stress (both biologically and psychology) when we have good amounts of these minerals.[533] [534] The reason why these four elements are important for adrenal functioning is that they are intimately involved in both the production/formation and release of these hormones.

The trace elements Manganese, Zinc, Chromium, and Selenium also impact on the function of the adrenal glands – although these elements are needed in tiny amounts. Scientific research shows that deficiencies in these trace elements can have negative effects on the way our adrenal glands are coping and functioning.[535] [536] [537]

The bottom line is that in terms of managing stress, a multimineral supplement is a very good idea to protect and optimize the functioning of the adrenal glands. This is really beneficial for health, especially when we supplement for short term periods.

Unfortunately for gout patients, the minerals linked to table salt in the diet (e.g. sodium and potassium) need to be carefully balanced because these minerals can affect uric acid production and the functioning of the kidneys. In fact, from a dietary perspective, we need to reduce how much table salt we're eating to help prevent gout symptoms. So, if you want to supplement with a multi-mineral supplement then I recommend you consult with a health professional to be totally safe and effective – as is always true of any medically relevant behavior.

Overall though, if you are making sure to follow a well-balanced diet (like the one we recommend for preventing and treating gout in this and the next section), then you will never become deficient in your essential minerals. Just that, in times of stress, for short periods, making sure you have these minerals by wisely supplementing can really help support your health and quality of life.

L-theanine

This compound is found in green tea. Although we covered green tea in an earlier chapter, here is yet another entry on its long list of amazing benefits. L-theanine is an amino acid that enhances relaxation, improves concentration and improves learning ability. [538] [539] [540]

L-theanine is similar in structure to the neurotransmitter *glutamate*, so it binds to glutamate receptors in the brain.[541] But, unlike glutamate, which can overstimulate pathways in the brain and cause complications like nerve cell damage, L-theanine actually *protects* brain cells against toxicity - it calms the nerve networks in the brain. [542] [543] [544] [545]

Other great benefits include the fact that L-theanine reduces the evidence of anxiety and depression in stressed animals; a positive indicator of its potent calming effects as a direct combatant to stress. Furthermore, L-Theanine seems to keep the heart beating in a more stable way when people are asked to respond to stressful tasks; improves our quality of sleep because it seems to promote calm and drowsiness near bedtime. Green tea also has a host of other benefits like we mentioned before because it is an amazing anti-inflammatory and antioxidant.[546] [547] [548] [549] [550] [551] [552]

Omega 3-Fatty Acids (Fish Oil)

The omega-3's keep getting mentioned, and like vitamin C & B, green tea, and many others we have mentioned, this is because the benefits of omega-3-fatty acids are massive – especially for gout, weight loss, stress, heart health, diabetic health and so on, and on.

Taking fish oil, krill oil or cod liver oil has been proven to significantly reduce the negative effects of stress, *and improve our ability to respond appropriately and decisively to stressors*. Omega-3-fatty acids balance the negative effects of the omega-6 fatty acids, which are in too large amounts in modern western diets.

The fatty acids are also key components of stress hormones (glucocorticoids) and are required to be in the correct ratio and concentrations in order to properly produce and secrete these hormones in optimal ranges. The key word that describes the omega-3 fatty acids and their effects on stress and anxiety responses is that they are what is called "adaptogenic". This means that if we ingest them in sufficient quantities then the body is able to raise or lower its stress response appropriately without loss of health or function. The omega-3 fatty acids are fantastic adaptogens, they allow us to adapt to challenging circumstances in optimal healthy and skillful ways.[553] [554] [555] [556] [557] [558] [559] [560]

In recent years omega-3 fatty acids have been used successfully to treat depression and anxiety disorders – these kinds of disorders are closely linked to both stress, pain, inflammatory conditions, IBD, microbiome imbalances and many more.[561] [562] [563]

Thus the omega-3 fatty acids are an extremely potent and beneficial source of awesome healing potential for stress and gout.

Probiotics & the Microbiome Can Help With Stress

We already know, from chapter two, just how important the microbiome is for gout. It turns out that the microbiome is also important for stress. A healthy microbiome helps us to deal with stress while an unhealthy microbiome actually contributes to biological stress. Stress also impacts the microbiome negatively, so we need to manage it and ingest probiotics to help out. If we don't, then unmanaged chronic levels of stress will impact our microbiome making us more vulnerable to stress which further impacts our microbiome which, once again, makes us even more vulnerable to the negative effects of stress – a descending spiral of negative health outcomes which should be prevented if possible.

Emerging research has revealed an important relationship between the gastrointestinal tract and its billions of resident organisms—often referred to as the microbiome—and the brain. This has been termed the "gut-brain axis".[564] [565] [566] [567] [568] [569] Probiotics are organisms which, when consumed in adequate doses, exert a beneficial effect on health.[570] Probiotics, because they are able to modulate the gut-brain axis, can ease the symptoms of stress, anxiety, and depression.[571] [572] [573] For stress purposes, countless studies have shown that *Lactobacillus helveticus* (*L. helveticus*) and *Bifidobacterium longum* (*B. longum*) are some of the best at helping the body cope. These two helpful critters are also incidentally really good for gout patients to take, as well as for diabetics and for people with irritable bowel disease.[574] [575] [576] [577] [578] [579] [580]

Herbal Therapies for Stress

Licorice (Glycyrrhiza glabra and G. uralensis)

Licorice root powder is a fantastic adaptogen for stress and hormones. Licorice is able to decrease the breakdown or metabolism of cortisone by the liver which increases the amount of cortisol in the bloodstream.[581] In combo with DHEA licorice may have the most benefit for both stress and IBS.

Over prolonged periods licorice can cause electrolyte imbalance (hypokalemia) and raise the blood pressure.[582] Remember however that licorice is very good at increasing depleted levels of cortisol so it is actually best used for those suffering from fatigue and not hyperactivation. In combo with DHEA, it can raise cortisol and balance out all the hormones involved in stress which means that it is particularly good at alleviating chronic fatigue, depression, and lethargy.

Sedative Herbs

Hops, passionflower, poppy, and valerian can provide reduce stress. **Lemon balm** (*Melissa officinalis*) is also able to reduce stress. Using any of these soporific (sedative) herbs can calm and ease tension and baseline anxiety helping the overstressed body to relax and enjoy life also aiding in sleep.[583] [584] [585] [586] [587]

Adaptogenic Herbs

There are several herbs that can act as adaptogens for providing the body with compounds that both aid in raising energy or aid in lowering anxiety and stress.[588]

To be classified as an adaptogen, herbs must have no toxicity, they must be able to normalize the body function back to optimal ranges from extreme highs or lows and they must work in the body via two or more physiological or biochemical pathways that are separate from each other (but might be interrelated e.g. controlling the same system but from a different angle).[589] [590] [591] [592]

The main adaptogenic herbs all work to condition the body to respond better to stress and include Ginseng, Rhodiola, Cordyceps and Ashwagandha to name only a few. [593] [594] [595] [596] [597]

Rhodiola

Rhodiola (*Rhodiola rosea*) can improve both physical endurance and cognitive performance.[598] [599] [600] It is also good at reducing fatigue associated with stress.[601] [602] [603] It works by assisting neurotransmitter transport in the brain and the blunting of catecholamine release.[604] [605] [606] Participants on trials that take Rhodiola have significantly lower cortisol levels in response to stress (especially chronic stress).

Ashwagandha

Ashwagandha (*Withania somnifera),* is an ancient and often used Ayurvedic medicinal herb. Used for treatment of stress, fatigue, pain, diabetes, and rheumatologic disorder.[607] Ashwagandha protects neurons from damage and reduces the harmful effects of stress on the male reproductive system, improving capacity.[608] [609] [610] [611]

Doses ranging from 125mg to 500mg per day of extracts made from the Ashwagandha plant helped protect the heart, reduce blood pressure, and reduced cortisol by as much as 30%.[612]

Ginseng

Ginseng (Panax Ginseng) is the most widely studied of the eleven species of ginseng known – although studies on American and Siberian Ginseng are both known.[613] [614] [615] [616]

The ginseng family of botanicals and non-botanicals is well known to have proven stress-reducing effects – notably anti-fatigue, protection against damage from diabetes, antidepressive and balancing effects on the HPA axis.[617] [618] [619] [620] [621] [622]

Basil (Ocimum tenuiflorum, or Holy Basil)

Basil really helps by protecting and maintaining the functioning of the adrenal glands.[623] [624] Holy basil is known for its ability to control blood sugar.[625] Compounds isolated from an extract of holy basil leaves are able to normalize high blood sugar, blood cortisol levels, and adrenal dysfunction.[626]

Studies done on Basil extracts done with healthy humans showed that treatment 300 mg per day for 4 weeks boosted the immune system. Other studies have shown good antidepressive effects such as improved attention, and an increased ability to cope with potentially stressful changes.[627] [628]

Bacopa

Bacopa (*Bacopa monnieri)* is used in Ayurveda as a tonic for the nervous system - it is known to promote mental health, improves cognitive (thinking or brain) performance, works as an excellent antianxiety medication and acts powerfully as an adaptogenic herb for the normalization of stress hormones.[629] [630] [631] [632] [633]

Cordyceps

Cordyceps (*Cordyceps sinensis)* is actually a type of mushroom used in Chinese medicine. Cordyceps has been found to boost the immune system and possesses antioxidant and anticancer properties.[634]

Cordyceps is really good at reversing adrenal problems linked to fatigue because it can boost cortisol levels whilst also protecting the adrenal glands from damage because of those increased cortisol levels. Cordyceps is thus really good to help people who are already very stressed.[635] [636] [637] [638] [639]

Schisandra

Chronic stress leads to sustained increases in cortisol levels and problematic negative effects on certain body systems.[640] *Schisandra* has typically been used as an anti-stress agent because it reduces our levels of corticosterone and glucose, this means it can protect us from the negative effects of stress on our adrenal glands and alleviate many symptoms linked to stress.[641]

There is also good evidence showing that *Schisandra* acts like a powerful adaptogen by increasing the ability of the body to respond to stressful things.[642]

Sleep

Not sleeping is related to very poor health outcomes including directly contributing to the causes and risk factors for heart disease. To make the point extremely clear the following health complications are associated with insomnia:

- Insomnia leads to higher levels of cortisol, epinephrine, and other stress hormones.[643] [644]
- Raised levels of cortisol lead to increased weight gain, poor immune functioning, and a heightened risk of diabetes, osteoporosis, inflammatory conditions (like gout for example), and heart problems.[645] [646] [647]
- Insomnia increases inflammation in the body because of increased secretion of hormones like interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF–α). Chronically elevated levels of IL-6 and TNF-α are linked to arthritis, gout, IBS (inflammatory bowel syndrome), and heart disease.[648]
- Insomnia makes us more sensitive to pain and therefore worsens conditions associated with acute and chronic pain.[649] Examples include arthritis and fibromyalgia. What is more, chronic pain can prevent sleep which in turn can cause insomnia which leads to chronic pain and so on. A horrifying catch-22 cycle of painful sleep disturbance. This is

very true of chronic gout which is what gout can become if nothing is done to limit its progression.

- Adults who do not get enough sleep on a chronic basis have up to four times the risk of stroke than those who usually get a good night's sleep.[650]
- Finally, and most disturbingly, adults with insomnia have an increased risk of death due to any cause!!!!!

Sleep is an extremely important aspect of health and overall quality of life. Studies indicate that between seven and eight hours of sleep per night in a regular pattern is best for maintaining optimal health.[651] [652]

Aside from melatonin (which we talked about briefly before this under hormonal balancing for stress), there are some other gentle natural sources which also help sleep e.g. rooibos tea, chamomile tea, and jasmine tea. They all contain some antioxidants (particularly rooibos tea), and jasmine particularly helps with pain (it acts like an analgesic), chamomile is very calming and directly induces sleep because it is a very mild soporific tea.

Teas for Sleep

Chamomile Flowers, Jasmine Flowers & Rooibos Herbal Tea

Place the following into a teapot for 3 cups of tea

- 1 Tablespoons of loose Jasmine Flowers or 2 sachets of Jasmine Flower tea
- 1 Tablespoon of loose Chamomile Flowers or 2 sachet Chamomile tea
- 1 Teaspoon Rooibos loose tea leaves

Add boiling water and let your tea steep for 5 - 10 minutes
Drink when cool enough.
It's best taken half an hour before retiring to bed.

Note: If you still can't sleep then take Melatonin as a supplement for the duration of your attack and then slowly taper off the amount. Speak to your favorite health practitioner to make sure that this is a healthy option for you and the best dose to suit your needs.

Meditation

Meditation is the intentional mindful activity of focusing on present awareness and resting consciousness naturally in an uncontrived fashion. Many studies show the benefits of meditation for our heart health, stress reduction, better memory, and overall cognitive function.

Sitting meditation with controlled breathing bears all the hallmarks of good heart health. Breathing slows along with heart rate, whilst stress levels decrease in response to imminent relaxation. The following benefits have been recorded in the research literature:

- A Harvard study showed that meditation/mindfulness practice enabled the regrowth of grey matter in the brain over an 8 week period. [653]
- Another study showed that meditation was able to decrease ADHD symptoms whilst increasing attention span. [654]
- Further findings showed that meditation reduces systolic blood pressure.[655]
- The American Heart Association (AHA) states unequivocally that meditation reduces blood pressure, a noted risk factor in gout. [656]
- The long-term effects of stress reduction due to meditation have been correlated with a 23% decrease in all causes of mortality.[657]
- Meditation is able to change genes involved in regulating lifespan implying that meditators might live longer.[658]

In short, meditation is an extremely skillful method of managing stress, improving attention, decreasing blood pressure and promoting all-round robust health. Meditating increases your expected lifespan and decreases cardiovascular risk.

If you would like to try meditation or mindfulness practice then you can try the simple technique of counting the breath. There are no hard and fast rules and the general principle is to sit quietly in the manner you are accustomed to. Make sure you are comfortable and maintain a clear awake awareness – don't fall asleep. Then pay attention to your own breathing watching the in and out breaths without attempting to control or alter the breath in any way. Count the breaths up to ten e.g. in-breath 1; out-breath 2; in-breath 3……out-breath 10. Once you reach the end ofout-breath-10 then begin the count again at in-breath-1 etc.

When people first start meditating, they usually discover that five minutes feels like an extremely long time - almost an eternity. But as familiarity develops people can maintain a calmly relaxed meditation session for 30 minutes to an hour or even more. Furthermore, and this may come as a surprise to many people, they often find it difficult to just calmly focus on the breath finding instead that their mind tends to wander off into thoughts, emotions and mental images or fantasies. This is completely normal; it just shows you how busy your inner mental world actually is. When you notice that you have wandered off mentally just calmly bring yourself back to your breath and begin the count again. There is no right way to do the practice – the only advice is to relax and enjoy. It is in relaxing and enjoying that we decrease stress and increase happiness. This is the main reason for mentioning meditation in this book.

If you enjoy the above meditation you may want to explore it further. There are many great sources of information such as books, audio CD's, binaural beats, hypnosis and even meditation teachers that can help us to explore our minds more deeply. Exploring meditation can lead to a

deep appreciation of some of the rich and long-standing history of contemplative cultures from all around the world, and the techniques that they have employed for exploring the mind and body for many thousands of years.

Meditation has the potential to help us develop a kind of mental clarity and stability which really helps us to navigate our daily lives in a more skillful way; allowing us to more easily resolve stressful situations successfully – the benefits of this stability and clarity should not be underestimated.[659]

Chapter 5

BRINGING IT ALL TOGETHER

Chapters one, two, three and four have all been pretty information-packed. So, in part this section we 'bring the information together' in order to make some simple suggestions.

Below we have produced a list of treatment goals summarized from relevant sections of the book to give you a working guideline to focus your efforts. The following characteristics are typical of the most successful strategies that you can use to achieve your goal.

Goals to Achieve a Healthy Gout-free Life

1. **Restore balance to uric acid cycle and prevent future gout attacks**
   - Eliminate food items that affect uric acid levels – Appendix 5
   - Alkaline diet to improve uric acid elimination – Appendix 1
   - Restore balance to the gut microbiome – through prebiotic fiber foods
   - Follow our 7 Day Meal Plan for guidance – Appendix 5
   - Limit factors that promote inflammation – See Tips and Principles listed below
     - ✓ Limit sugar and avoid unhealthy fats
     - ✓ Reduce stress
     - ✓ Ensure quality sleep
     - ✓ Enjoy moderate exercise

2. **Manage acute gout attacks – Fast Aid Toolkit**

   Fast Aid Toolkit – Pain management for acute gout attacks Appendix 6

3. **Supplementation to support the initial treatment plan**

   (See below, refer to chapter 3, and Refer to Appendix 7 for other effective therapeutics)
   - Vitamins
   - Minerals
   - Herbs for Xanthine Oxidase inhibition
   - Stress-busting strategies
   - Sleep improvement formula
   - Antioxidants that provide support & reduce painful inflammation

Bonus Benefits

- Balances blood sugar levels and reduces diabetes type 2 risk
- Improves insulin sensitivity

- Promotes natural fat loss
- Protects from multiple chronic lifestyle conditions
- Anti-Aging – improves vitality and healthy longevity

So now that our goals and targets are clearly defined, we can review each section of the book to adopt and reject things that tackle each important aspect of diabetes.

Extract general guidelines discussed in this book and incorporate each point gradually until all of them become the way you live your life from day today. Remember to adopt solutions that suit you and return to the list later to see if you are able to tackle further changes as your health and wellbeing improve.

Quick Hints & Suggestions for a Gout-Free Lifestyle

The following foods and drinks have just what we need to combat gout and provide interesting nutritionally viable diets: So, increase the following:

1. All berries, blueberries, tart cherries, cranberries, and strawberries – think resveratrol and polyphenols – and delicious too!
2. Dark grapes, now and then 40 grams quality dark chocolate (70% cacao or more) and the occasional glass of red wine – more resveratrol and better health
3. Celery smoothies – Keep your microbiome 'inner tribe' happy and healthy!
4. Coconut or Olive oil - these oils are healthy lipid sources that don't contribute to chronic inflammation
5. Raw unsalted nuts – Enjoy a handful now and again of raw pistachios, walnuts, macadamias, and almond nuts
6. White mulberries – exotic natural superfood
7. Turmeric - think "curcumin" and combine with ground black pepper
8. Green Tea - Make this your main drink throughout the day until 16h00 – you'll be surprised how good it makes you feel
9. Jasmine Flower Tea (Pain), Tulsi Tea (Stress), Chamomile Tea (Sleep), Five Spice Chai Gout Tea (Inflammation), Willow Bark Tea (Pain)
10. Pure ground filter coffee (as opposed to granulated freeze-dried types)
11. 1 cup in the morning without sugar (Stevia or honey can be used to sweeten)
12. Fiber-rich prebiotic foods such as those discussed in the microbiome section A minimum of 30 grams daily fiber is ideal – remember to drink plenty of mineral-rich water daily to avoid constipation
13. Magnesium-rich foods, such as pumpkin seeds, almonds, and cultured yogurt
14. Low-glycemic foods (Refer to Appendix 2) such as stone fruits, all berries, avocados, non-starchy vegetables, coconut, and free-range eggs
15. Pink Himalayan salt or natural sources of mineral-rich salt – use in moderation

16. Drink 6 – 8 glasses filtered mineral-rich water daily – consider adding half a squeezed lemon to alkalinize your body at the start of each day
17. Pineapple – full of digestive enzyme Bromelain & useful for combatting gout conditions
18. Honey or Stevia instead of other sugars
19. Prebiotic, fruit & vegetable smoothies – make sure to invest in a good glass blender and enjoy simple, easy healthy food. It's a good way to make sure that you eat more fresh uncooked food packed full of vital nutrients to boost energy levels …

Principles for Gout

- Low Purine content foods – See Recommendation Chart below & Appendix 5 (Purine Food Lists – Listed Categories A - C)
- Alkaline Foods – Refer to Appendix 1
- Low Glycemic foods – Refer to Appendix 2 (The Glycemic Index)
- High Fiber Foods - See chapter 2 - Prebiotics
- Avoid Lectins – See chapter 2 and Chapter 4 – Lectin free diet

Avoid These (!!!)

- High Purine content foods (Appendix 5) – Listed as Category E & D
- Acidic Foods – Appendix 1 – Alkaline & Acid Foods
- High Glycemic foods (Appendix 2) - Refined sugar increases uric acid, blood glucose levels and inflammation – avoid this completely!
- Artificial sweeteners - Although they aren't sugar, they are toxic
- No High Fructose Corn Syrup (HFCS – see appendix 4)
- Eliminate all commercial fruit juice and sodas
- Additives, food colorants, heavy metals, pesticides -these compounds generate inflammation – avoid avoid avoid …
- Refined or Processed foods - These have limited nutrient value, generate inflammation, acidic conditions and cause large glucose surges because they are rapidly digested
- Pulp Free sweetened (or artificially sweetened) Fruit juice - is basically not healthy at all!
- Alcohol use - these activities dump sugar into the bloodstream and are generally extremely toxic for the body
- Trans fatty acids and hydrogenated rancid cooking oils, such as sunflower seed oil, soybean, cottonseed, and canola oil because these are all processed using very high temperatures - they cause many harmful inflammatory effects
- Avoid lectins - including grains (especially the ones containing gluten, such as wheat), potatoes, tomatoes and aubergines, cashew nuts, peanuts and legumes that are not sprouted or properly fermented
- Frying, baking, grilling, and barbecues need to be especially avoided, along with smoked products as these are toxic causing havoc in our GIT
- Avoid using aluminum cooking pots – Stainless steel is far better for your health

- GMO foods such as corn, soy, and canola - multiple studies have proven that these foods directly relate to liver and kidney diseases that increase risks for gout along with all chronic lifestyle disorders
- Avoid table salt with anti-caking agents

Exercise

- All you need is a 30-minute daily session where your activity level is appropriate to your needs. Start slowly with 3 sessions and build up to five times a week – this is all you need to aim for in the beginning.
- You could approach a health fitness professional and share your medical concerns, then work out an exercise activity that you enjoy and that will be of benefit.
- Introduce more active hobbies or activities in your life that you love and enjoy. Especially those that take you into nature. Great examples are hiking, surfing, scuba diving or some kind of sport or game. Enjoy!

One last thing…

- Stress! Reduce it as much as possible. Exercise helps with this, but other factors also help such as sleeping properly, meditating, developing strong social networks, being in nature and having a pet. Consider learning something new every day and increase your creativity too! Check out your options and choose to do things that work for you, because stress wastes energy, promotes inflammation and increases poor decision making – which promotes more stress.

  Remember that we may not be able to reduce having stressful events in our modern lives but we can manage the way we respond to stress – it's up to us to break the cycle of reactivity!

A Supplementation Skeleton

We recommend taking supplements for the initial phase (3 – 6 months) of your new Gout-free Lifestyle. This is because it can help support your body until the lifestyle changes take effect. Remember that gout did not happen overnight even if it appears that way!

The table on the next page lists some of the powerful and safe tools that we can supplement to help us manage and reverse gout with all its complications. There is a quick summary of all the supplemental tools discussed throughout the book in Appendix 7.

The dosage guidelines listed here are taken from research papers, but you should know that this is just a working example. THE DOSAGE APPROPRIATE FOR YOU, in particular, is likely to vary from our example supplementation schedule.

Definitely consult with an expert before you take any of these supplements, no matter what a trusted source may say – the risks aren't worth making a silly mistake. Another thing to realize is

that we have not mentioned how many times a day, whether before or after meals is best nor whether it should be taken at night, in the morning or at lunch – best to ask an expert to work with you

Our Recommended Supplements For Gout

SUPPLEMENT NAME	**PROPOSED DOSAGE**
Cod liver Oil	5 - 10ml per day
Curcumin	(As indicated by product/expert)
Ginkgo biloba	40 – 50 mg
Grape Seed Extract	140 – 280 mg
Magnesium	300 mg
Micronutrient Supplement (trace mineral supplement)	(As indicated by product/expert)
Multi-vitamin (including a comprehensive B complex)	(As indicated by product/expert)
Resveratrol	110 - 120 mg
Vitamin C	2 grams (2 -3 times daily)
Vitamin D3	800 IU
Zinc polynicotinate	22 mg
Vitamin B supplement – mega- absorbable	(As indicated by product/expert)
Ashwaganda	(As indicated by product/expert)
Melatonin	(Consult a health practitioner)
Glycerrhiza glabra (Licorice root)	(Consult a health practitioner)
DHEA	Men 50 mg in the morning Ladies 25 mg in the morning

Appendix 1

Alkaline Foods – (Good Options)[660]

(Information Adapted from source)

Vegetables:

- Carrots
- Celery
- Chards
- Beet Roots (Including Tops)
- Lettuce
- Kohlrabi
- Cucumber
- Pickled Vegetables – Prebiotic Foods
- Garlic
- Onion
- Mushrooms
- Pumpkin
- Turnip
- Spinach
- Asparagus
- Brussels Sprouts
- Bell Pepper
- Horseradish

Fruit:

- Apples
- Tangerines
- Peach
- Pears
- Watermelons
- Raspberries
- Wild Strawberries
- Strawberries
- Blackberries
- Sweet Cherries
- Grapes
- Avocados
- Bananas
- Dried Apricots
- Kiwi-fruits
- Mango
- Figs / Dates – in moderation because they can shoot up blood sugar levels due to a high glycemic index
- Currants
- Grapefruits
- Lemons
- Limes
- Oranges
- Pineapple
- Papaya (papino or paw-paw)
- Tangerines
- Freshly squeezed fruit and vegetables **with** pulp included are powerful energy boosters

Protein:

- Eggs
- Yogurt
- Chicken Breast
- Flaxseeds
- Pumpkin Seeds
- Squash Seeds
- Summer Squash Seeds
- Sunflower Seeds
- Sprouts
- Millet

Spices / Condiments:

- Curry
- Turmeric / Curcumin with Black Pepper
- Rosemary
- Cinnamon
- Ginger

- Apple Cider Vinegar
- Himalayan Pink Salt

Other:

- Bee Pollen
- Mineral Waters
- Molasses
- Green and Herbal Teas

Acidic Foods – (Bad Options)[1]

- Avoid These Foods Unless Indicated

Vegetables:

- Lentils
- Olives
- Potatoes
- Black, Red & White Beans
- Chickpea
- Soybeans

Fruit:

- Blueberry – High source of resveratrol
- Cranberry – Very good for urinary tract infections
- Plums

Protein:

- Bacon
- Veal
- Turkey
- Game Meat
- Pork
- Rabbit
- Smoked Sausage
- Carp
- Cod
- Salmon
- Tuna
- Haddock
- Lobster
- Oysters
- Shrimps
- Shellfish
- Pike
- Sardines
- Cheese – especially processed cheeses that undergo bleaching, and have dyes (colorants) added along with many other chemical additives

Spices / Condiments:

- Sugar – all refined and artificial sweeteners
- Mustard
- Vinegar
- Ketchup
- Most store-prepared commercial condiments
- Cacao – May be used moderately if a top-quality cacao product is sourced

Cereals:

- Barley
- Rye
- Wheat
- Spelt
- Oat Bran
- Flour
- Bread
- Pasta
- Rice
- Rice Cookies

Fats:

- Sesame Oil
- Sunflower Oil
- Avocado Oil– Accepted in moderation
- Hempseed Oil
- Olive Oil – Accepted in moderation
- Butter – Accepted in moderation
- Lard
- Hazelnuts – Accepted in moderation
- Walnuts – Accepted in moderation
- Peanuts

Alcohols:

- Beer
- Wine – Red wine on rare occasions appears to be less damaging than other alcohols
- Spirit
- Liqueurs

Drugs:

- Aspirin

Other:

- Sweetened non-alcoholic beverage consumption (i.e. Sodas)
- High fructose content in food or beverages
- High Fructose Corn Syrup
- Commercial artificial sweeteners – all of them
- Refined sugar

Appendix 2 - The Glycemic Index

The glycemic index (GI) is a list or index of foods that have been given an index number that shows the degree to which blood sugar spikes in response to eating them. Naturally, the GI is an invaluable resource for diabetes, obesity, and gout. However, adopting a low GI approach to a diet will actually have many benefits for anyone, even apparently healthy people. This means that understanding how it works can only be of immense benefit.[1]

Only foods that contain carbohydrates are rated with the GI system. The smaller the index number a food has on the GI the lower the blood spike will be after eating it.

Low GI foods are classified as having a GI of 55 or less, and the foods that populate this end of the GI spectrum tend to be packed with nutrient-rich fruits, vegetables, beans, and some grains.

Medium GI foods range between 56 and 69 on the GI index, whilst High GI foods cause rather large blood glucose spikes and occupy GI index values of 70 or more.

Typically, foods in the high GI category tend to be highly processed or extremely refined, sweet and sugary foods like table sugar, dates or ice cream.

Please refer to the GI table beginning on the next page for a nice GI list of foods categorized into Low, medium, and high GI index scores.[2]

LOW GLYCEMIC INDEX (< 55)

Fruits	
Apples	38
Apple juice	40
Apricots, dried	31
Bananas	54
Blueberries	25
Cherries	22
Coconut	45
Cranberries	45
Cranberry juice	50
Figs, dried	40
Grapefruit	25
Grapes	46
Orange juice	53
Oranges	44
Peaches	42
Pears, fresh	53
Plantains, raw	45
Plums	55
Strawberries	41
Vegetables	
Artichokes	20
Asparagus	15
Bamboo shoots, raw	20
Beet greens	20
Broccoli	15
Broccoli rabe	10
Brussel sprouts	15
Butternut squash, baked	50
Cabbage, Chinese	10
Cabbage, savoy, boiled	15
Carrot juice	45
Carrots, raw	47
Cauliflower	15
Celery	15
Collard greens	20
Corn, sweet	54

Cucumber	15
Eggplant	15
Garlic	30
Green beans	15
Hubbard squash, baked	50
Kale	15
Leeks	15
Lettuce	15
Lima beans, baby, frozen	46
Okra, raw	15
Olives	15
Onions	15
Peppers	15
Pickles, dill	15
Turnip greens, boiled	10
Turnips, boiled	30
Snow peas	15
Summer squash	15
Tomato soup	54
Tomatoes	15
Spinach	15
Summer squash	15
Tomato soup	54
Tomatoes	15
Watercress	10
Grains, Breads & Cereals	
Banana bread	47
Barley	25
Basmati rice	50
Bran cereal	42
Brown rice	50
Bulgur wheat, whole, cooked	45
Chickpeas	33
Fettuccine	32
Matzo bread	40
Quinoa	53
Ravioli, meat	39
Rice bran	27
Rice, parboiled	47

Spaghetti, protein-enriched	38
Spaghetti, wholemeal	53
Spaghetti, whole wheat	37
Tortellini, cheese	50
Vermicelli	35
Dairy and Dairy Alternatives	
Chocolate milk	32
Skim milk	32
Soy milk	43
Yogurt, low fat, artificially sweetened	15
Yogurt, low fat, fruit, sugar-sweetened	46
Yogurt, plain	14
Nuts and Legumes	
Almonds	15
Black Beans	30
Broad beans	40
Butter beans	43
Cashews	23
Chickpeas	33
Fava beans	40
Horse beans	40
Kidney beans	41
Navy beans	54
Peanuts	14
Pinto bean	39
Soybeans, boiled	16
Split peas, yellow, boiled	45
Snacks & Sweets	
Honey	55
Hummus	6
Power Bar	53
Snickers	41
Strawberry jam	51

MEDIUM GLYCEMIC INDEX (From 56 to 69)

Fruits	
Apricots, canned with light syrup	64
Apricots, fresh	57
Cantaloupe	65
Fruit cocktail	55
Grapes	66
Mango juice, unsweetened	55
Mangoes	56
Oranges	63
Orange juice	55
Papaya, fresh	55
Peaches, fresh	60
Peaches, canned	67
Pineapple	59
Raisins	64
Vegetables	
Marrowfat peas, dried	56
Peas, green	68
Sweet potato	61
Grains, Breads & Cereals	
All-Bran	60
Bulgur	68
Couscous	65
Hamburger bun	61
Instant noodles	67
Instant porridge	66
Lasagna	60
Linguine	65
Macaroni and cheese	64
Mixed grain bread	69
Oat bran bread	68
Oatmeal, plain	58
Pancakes	60
Pita bread	57
Quick-cooking porridge	65
Rye crispbread	65
Rye kernel bread	66
Spaghetti, white	59
Taco shells	68

Wheat kernels	59
Whole-white bread	67
Wild rice	57
Dairy and Dairy Alternatives	
Mayonnaise	60
Nuts and Legumes	
Black-eyed peas	59
Chestnuts	60
Lentil soup, canned	63
Pinto beans, canned	64
Snacks & Sweets	
Blueberry muffin	59
Bran muffin	60
Coca-Cola	63
Ketchup	55
Mustard	55
Nutella	55
Pizza, cheese	63
Sponge cake	66
Sushi	55

HIGH GLYCEMIC INDEX (≥ 70)

Fruits	
Dates	103
Kiwifruit	75
Watermelon	72
Vegetables	
Parsnips	139
Pumpkin	107
Rutabaga	103
Potato, instant	121
Potato, mashed	100
Potato, microwaved	117
Potato, white, baked	85

Grains, Breads & Cereals	
Bagel	72
Bagel, white	103
Barley flour bread	95
Bran buds	77
Bran Chex	83
Bread stuffing	106
Cheerios	106
Cocoa Pops	79
Corn Flakes	81
French baguette	136
French bread	95
Gluten-free bread	90
Gnocchi	95
Golden Grahams	102
Grape Nuts	75
Hamburger bun	87
Kaiser roll	104
Life cereal	94
Muesli	80
Muesli bars	87
Oat kernel bread	93
Oatmeal	87
Pita bread, white	82
Pumpernickel bread	71
Rice cakes	82
Rice Chex	127
Rice Krispies	117
Rice, brown	79
Rice, instant	128
Rice, white	83
Rye flour bread	92
Shredded Wheat	75
Special K	77
Tapioca, boiled with milk	115
Water crackers	102
Waffles	109
Wheat bread	97
White bread	70

Dairy and Dairy Alternatives	
Ice cream, full-fat	87
Ice cream, low-fat	71
Tofu, frozen dessert, non-dairy	164
Nuts and Legumes	
Black bean soup	92
Green pea soup, canned	94
Kidney beans, canned	74
Lentils, canned	74
Split pea soup	86
Snacks & Sweets	
Cake, angel food	95
Cake, pound	77
Corn chips	105
Corn syrup	90
Croissant	96
Doughnuts	108
French fries	75
Gatorade	78
Glucose	138
Graham crackers	74
Jelly beans	80
Life Savers	70
Maltodextrin	95
Maltose	152
Nutri-Grain bar	94
Oatmeal cookies	79
Pastry	84
Popcorn	72
Pretzels	83
Shortbread	91
Stoned Wheat Thins	96
Sugar, table	89

Appendix 3 – Natural Sources of Sugar Commonly Added To Foods

DIFFERENT SOURCES OF NATURALLY DERIVED SUGARS COMMONLY ADDED TO FOOD PRODUCTS *(Listed Alphabetically)*			
Agave nectar	Barbados sugar	Barley malt	Barley malt syrup
Beet sugar	Brown sugar	Buttered syrup	Cane juice
Cane juice crystals	Cane sugar	Caramel	Carob syrup
Castor sugar	Coconut palm sugar	Coconut sugar	Confectioner's sugar
Corn sweetener	Corn syrup	Corn syrup (solid)	Date sugar
Dehydrated cane juice	Demerara sugar	Dextrin	Dextrose
Evaporated cane juice	Fructose	Fruit juice	Fruit juice concentrate
Glucose	Glucose solids	Golden sugar	Golden syrup
Grape sugar	Honey	Icing sugar	Invert sugar
Malt syrup	Maltodextrin	Maltol	Maltose
Mannose	Maple syrup	Molasses	Muscovado
Palm sugar	Panocha	Powdered sugar	Raw sugar
Refiner's syrup	Rice syrup	Saccharose	Sorghum Syrup
Sucrose	Sugar (granulated)	Sweet Sorghum	Syrup
Treacle	Turbinado sugar	Yellow sugar	HFCS*

* HFCS = High Fructose Corn Syrup

Appendix 4 - HFCS

The Effects of High Fructose Corn Syrup (HFCS)

It turns out that HFCS is very commonly used in commercial products around the world and may be one of the most important factors contributing to negative health in multiple diseases and conditions, not just gout.

HFCS is a syrupy concentrate made from corn which sounds healthy enough because people think that corn is healthy. Could there, therefore, be any danger to using this corn-derived fructose syrup? Well, the evidence that has accumulated (and still keeps accumulating) showing the HFCS is nothing other than a dangerous toxic sweetening additive is pretty persuasive.

Historically, researchers have noticed that in countries where there had been a high dietary intake of HFCS, there was also a large increase in the rate of people diagnosed with type-2 diabetes – as much as 20% higher.[3] Of course, this finding only highlights a correlation between the fact that the more people eat HFCS the more diabetes seems to be diagnosed. The study does not show that HFCS causes an increase in diabetic occurrence. While this observation is true, it can be very difficult to prove causation. Consider that for the longest time tobacco smoking was not directly linked to mortal forms of cancer because to establish causality is much more difficult than describing a mere correlation. To say it more simply, imagine a person dies from lung cancer and they also happened to smoke. How do we know that it was the smoking that caused cancer and not the pesticides that that person used to spray the garden every summer? There can always be an alternative explanation for what causes something.

In the cases like smoking, and HFCS, and any other strong correlations, what usually happens is that the relationship is noted and evidence then gets gathered until the evidence becomes so numerous and compelling that it would be much more likely that the relationship was, in fact, pointing to causality – i.e. smoking *causes* cancer or that HFCS causes higher rates of diabetes type-2.

So how much evidence of this relationship actually exists, and what other findings point to similar effects?

There are many findings which we could list to show the negative consequences associated with HFCS ingestion. The list of such papers is now up to several hundred published on different aspects of the subject, and, it's growing. To give a good taste of some of the major findings, here is a sample of results drawn from a pool of just 106 (!) of these scientific studies:

- HFCS increases lipids and fat accumulation around the abdomen when consumed in beverages (linked to Obesity)

- HFCS reduces insulin sensitivity in overweight or obese people when consumed in beverages.[4] (Linked to Diabetes and obesity)
- Fructose disrupts the function of our glands and hormones – it is a known endocrine disruptor. (link to cancer, abnormal growth and maturation and much more)
- Increases the risk of Gout and cardiovascular disease (CVD).[5] (CVD is a major concern for obese individuals as well as some diabetics)
- Correlated with intestinal cancer (!)
- Excess fructose consumption contributes to the development of metabolic syndrome as well as the progression of non-alcoholic fatty liver disease.[6] (Metabolic syndrome is a concern for chronic fatigue, diabetes, and obese people)
- Consuming fructose is associated with worse breast cancer symptoms.[7]
- HFCS is strongly linked to high blood pressure, higher protein contents in urine, and inflammation.[8] (High blood pressure is a concern for diabetics and obese people. Inflammation is a major risk factor, and possible causal mechanism for diabetes)
- Fructose consumed in high dosages results in higher blood pressure and contributes to developing metabolic syndrome.[9] (Linked to diabetes and obesity and many other lifestyle disorders.)
- Higher sugar intake sugar is linked with decreased cognitive performance especially over a few hours after consumption – long-term lifetime use effects not studied yet.[10](It literally makes us less intelligent)
- Fructose intake increases myocardial infarction in senile patients.[11] (Linked to dementia and heart disease)
- Consuming fructose increases the likelihood of developing liver cancer.[12]
- Fructose intake in animal studies ***causes*** insulin resistance.[13] (An animal study confirms HFCS as a cause of insulin resistance – Very concerning for diabetes)
- Fructose causes problems with metabolism and causes insulin resistance. (Another animal study showing HFCS as causing insulin resistance)[14]
- Rats that eat fructose have much higher rates of abnormalities in their hearts and seem to develop a deficiency in copper.[15]
- Another study on rats showed that after they were given diets rich in fructose that they were not able to regenerate brain cells as fast as rats who did not have such a diet – particularly in the brain areas for memory.[16] (A link to dementia)
- Fructose causes glycation of proteins which makes them age abnormally quickly.[17] (Fructose linked to accelerated aging)
- Fructose acts like an opioid in the brain which means that it is likely to be chemically addictive in humans.[18]
- Fructose promotes fat production (a process known as lipogenesis).[19] (A clear link to obesity)

- Fructose accelerates the progression of chronic kidney disease.[20] (Kidney problems are also associated with diabetes).
- Fructose causes inflammation and scarring (fibrosis) in kidneys.[21]
- A study done on mice showed that they developed night-time high blood pressure after being given a diet that contained fructose.[22]
- Fructose is linked to cancer growth in the pancreas.[23] (The pancreas is very important to diabetics and their particular symptom profiles).
- According to one study, fructose is able to accelerate aging much faster than glucose.[24]
- Cancer cells are easily able to make use of refined fructose as an energy source meaning that fructose will support the growth and proliferation of cancerous cells generally.[25]
- According to another study, both glucose and fructose support cancer growth and proliferation.[26]

A final interesting finding is well worth pointing out. In the initial study that we mentioned where the consumption rates of HFCS were compared across different populations in different countries, it turned out that the US adult population had by far the highest rate of HFCS consumption out of all the countries included in that study. How much HFCS is America eating?

An average of 25 kilograms (55 pounds) of HFCS per year! This is staggering considering that low intake countries averaged around 0.5kg per year (India, Slovenia, Ireland, Sweden, Austria, and Denmark. The difference between the highest and lowest is a factor of fifty.

One of the scientists involved in this interesting study was quoted as follows[27],

"…most populations have an almost insatiable appetite for sweet foods, but regrettably *our metabolism has not evolved sufficiently to be able to process the fructose from high fructose corn syrup in the quantities that some people are consuming it*."

(Italics are our own emphasis)

In other words, if you're from the US, then he is talking directly to YOU – however, the observation should be remembered by all.

All of the above constitutes quite a compelling set of findings. Taken collectively, these types of findings are becoming more and more difficult to deny. Eventually, such denial will become comical, even farcical. We think the point is made, and hope you agree, HFCS is indeed a devilish health villain that we should avoid it at all costs.

Appendix 5 - Seven Day Example Meal Plan

(Including resources to safely choose your own foods that contain purines)

This appendix contains a nice and simple example 7-day meal plan for gout treatment. It was created from the information in this book and is based on all the guidelines found in chapter 5. The meal plan we have provided below is a great example of how to apply the tips and instructions in chapter five and we hope that this is a great skeleton for people who want to use it and modify it for variety.

Of course, this plan can be repeated on a weekly basis, but it is meant to serve as inspiration for your personal tweaks and modifications.

Just after the weekly meal plan, we have provided some tables that list the purine foods and the portions gout patients would be allowed to eat and still be healthy. This appendix should be of invaluable help for people as they implement their own healing strategies going forward.

(Meal plan starts on the next page)

DAY 1	
Breakfast	Paw-paw, squeezed lemon honey - optional Coffee or green tea
10h00	Cherished Cherry Smoothie Green Tea
Lunch	Salad - Avocado, lettuce, finely grated cabbage & carrots, boiled egg Honey, lemon, garlic dressing Green Tea
15h30	Celery & Apple Smoothie
Dinner	Lentil curry, steamed wild brown rice
Bedtime	Jasmine, Chamomile & Rooibos Tea
DAY 2	
	Water with lemon
Breakfast	Fruit Salad & Yoghurt honey - optional Coffee or green tea
10h00	Cherished Cherry Smoothie Green Tea
Lunch	Quinoa Salad - Avocado, green beans spring onions, chopped walnuts, grated carrots with humus dressing
15h30	Celery & Pineapple Smoothie
Dinner	Omelet with garlic, kale & feta
Bedtime	Jasmine, Camomile & Rooibos Tea
DAY 3	
	Water with lemon

Breakfast	Stewed apple, pear, cinnamon honey - served with yogurt Coffee or green tea
10h00	Cherished Cherry Smoothie
	Green Tea & Spearmint
Lunch	Steamed vegetables with garlic olive oil dressing - green side salad Carrot & pineapple smoothie
15h30	Celery & Apple Smoothie
Dinner	Omelet with garlic, spring onion kale & feta
Bedtime	Jasmine, Camomile & Rooibos Tea

DAY 4	
Breakfast	Red Grapefruit Boiled Egg Coffee or green tea
10h00	Cherished Cherry Smoothie
	Minty Green Tea
Lunch	Couscous salad with sliced veg Tahini and hummus dressing
15h30	Celery & Strawberry Smoothie
Dinner	Vegetable & chicken breast stew
Bedtime	Jasmine, Camomile & Rooibos Tea

Day 5	
	Lemon Mint Water
Breakfast	Cubed Paw paw, Avocado, Kiwi,

	Pomegranates - Honey is optional Coffee or green tea
10h00	Cherished Cherry Smoothie Minty Green Tea
Lunch	Salad - Avocado, lettuce, finely grated cabbage, asparagus, cottage cheese Honey, lemon, garlic dressing
15h30	Celery & Apple Smoothie
Dinner	Lentil & vegetable soup Cacao Mousse
Bedtime	Jasmine, Camomile & Rooibos Tea
	DAY 6
	Lemon Mint Water
Breakfast	Poached Eggs & white garlic sauce Coffee or green tea
10h00	Cherished Cherry Smoothie Minty Green Tea
Lunch	Steamed couscous with steamed vegetables, garlic lemon & olive oil dressing
15h30	Celery & Apple Smoothie
Dinner	Lentil & vegetable soup Cacao Mousse
Bedtime	Jasmine, Camomile & Rooibos Tea
	DAY 7
	Minty Lemon Water
Breakfast	Stewed apple, pear, cinnamon

	honey - served with yogurt
10h00	Cherished Cherry Smoothie
	Minty Green Tea
Lunch	Steamed rice with vegetables, boiled egg, flaxseeds - garlic white sauce & green salad
15h30	Banana, Walnuts, Honey, Tahini Smoothie Treat
Dinner	Beef & Vegetable Stew Serve with steamed wild rice
Bedtime	Jasmine, Camomile & Rooibos Tea

Purine Food Portions: Recommended Purine Foods & Portion Sizes for Healthy Gout Eating

Recommended Foods - Less than 50 mg Uric Acid (per portion)		
	Portion	**Notes**
Milk	200 ml	Free-range
Cottage cheese	50 grams	Free-range
Unprocessed cheese	30 grams	Free-range
Coffee	1 cup	Organic filtered
Cucumbers	200 grams	Organic - non GMO
White cabbage	200 grams	Organic - non GMO
Sauerkraut	200 grams	Organic - non GMO
Beetroot	200 grams	Organic - non GMO
Zucchini	200 grams	Organic - non GMO
Carrots	200 grams	Organic - non GMO
Celery	200 grams	Organic - non GMO
Walnuts	30 grams	About a handful
Apples	150 grams	Organic - non GMO
Pears	150 grams	Organic - non GMO
Cherries - Tart	230 grams	Organic - non GMO
Cherries - Sweet	150 grams	Organic - non GMO
Apricots	150 grams	Organic - non GMO
Gooseberries	150 grams	Organic - non GMO
Currants	150 grams	Organic - non GMO
Strawberries	150 grams	Organic - non GMO
Raspberries	150 grams	Organic - non GMO
Kiwi	150 grams	Organic - non GMO
Grapes	150 grams	Organic - non GMO
Oranges	150 grams	Organic - non GMO
Pineapple	150 grams	Organic - non GMO
Papayo / Paw paw	150 grams	Organic - non GMO
Olive Oil	1 Tablespoon	Cold-pressed
Coconut oil	1 Tablespoon	Cold-pressed
Butter	1 Tablespoon	
Ghee	1 Tablespoon	

Moderate Use - Gives 50 mg - 100 mg Uric Acid (per portion)		
Skinless chicken breast	100 grams	Free Range
Flounder or Tench	100 grams	Wild-caught
Beef	100 grams	Lean free-range
Pumpkin	200 grams	Organic - non GMO
Green Beans	200 grams	Organic - non GMO
Red Cabbage	200 grams	Organic - non GMO
Kale	200 grams	Organic - non GMO
Banana	150 grams	Organic - non GMO
Melon	150 grams	Organic - non GMO
Restricted use - Gives more than 100 mg Uric Acid (per portion)		
Cauliflower	200 grams	Organic - non GMO
Broccoli	200 grams	Organic - non GMO
Leek	200 grams	Organic - non GMO
Mushrooms - wild boletus	200 grams	Organic - non GMO
Mushrooms - Champignon	200 grams	Organic - non GMO
Green peas	200 grams	Organic - non GMO
Spinach	200 grams	Steamed for 10 mins
Mackerel	100 grams	Wild-caught
Trout	100 grams	Wild-caught

NB: Purine intake should not exceed a daily amount of 500 mg of Uric Acid*

*For example, if you decide to have a portion of cauliflower it is contributing 100 mg of Uric Acid leaving you another 400 mg left until you have reached your maximum level of purine intake daily.

General Foods & Their Purine Contents

Table 1. Amount of Purines in Cereals, Beans, Soybean Products, and Dried Seaweeds (mg/100 g)

	Foodstuffs	Adenine	Guanine	Hypo xanthine	Xanthine	Total	Calculated as uric acid	Grp
	Barley	21.6	22.7	0	0	44.3	52.1	A
Cereals	Buckwheat flour	35.1	40.8	0	0	75.9	89.1	B
	Flour (bread flour)	12.2	13.6	0	0	25.8	30.3	A
	Flour (cake flour)	8.1	7.6	0	0	15.7	18.5	A
	Flour (pastry flour)	12.2	13.6	0	0	25.8	30.3	A
	Rice (polished)	10.8	15.1	0	0	25.9	30.3	A
	Rice (unpolished)	16.2	21.2	0	0	37.4	43.7	A
	Rice (with the bud)	14.9	19.6	0	0	34.5	40.3	A
	Almond	13.6	13.8	2.3	1.7	31.4	37	A
Beans	Azuki bean (dried)*	33.8	43.8	0	0	77.6	90.8	B
	Broad bean	14.1	19.9	1.3	0.2	35.5	41.5	A
	Green-peas (canned)	6.8	12.1	0	ND	18.8	21.9	A
	Peanut	18.9	28.6	0	1.6	49.1	57.1	A
	Bean Curd Lees (Okara)	15	24	4.5	5	48.6	56.6	A
Soybean Products	Deep-Fried Tofu	20.3	32.4	0.5	1.2	54.4	63.2	B
	Fermented Soybean (Natto)	40.5	51.4	6.8	15.2	113.9	132.8	C
	Freeze-dried Tofu*	120.4	168.3	0.6	3.7	293.1	342	D
	Green Soybean	20.8	27.2	0	0	47.9	56.1	A
	Soymilk	7.7	11.7	2.5	0	22	25.8	A
	Soybean (dried)*	74.3	98.2	0	0	172.5	201.7	C
	Tofu (Kinu)	7.6	11.2	0.5	0.7	20	23.3	A
	Tofu (Momen, chilled)	14	16.7	0.4	0	31.1	36.5	A
	Tofu (Momen, 3min boiled)	13.1	8.8	0	0	21.9	26	A
	Mozuku (Cladosiphon okamuranus)	5.6	9.4	0.5	0	15.4	18	A
Dried Seaweeds	Hijiki*	31.1	76.5	25.1	0	132.8	154.9	C
	Kombu	18	21.8	4.7	1.9	46.4	54.5	A
	Nori*	216	299.2	73.3	3.2	591.7	695.6	E
	Wakame*	67.7	148.1	46.6	0	262.4	306.5	D

Table 2: Amount of Purines in Eggs, Dairy Products, Mushrooms, and Fruits (mg/100 g)

	Foodstuffs	Adenine	Guanine	Hypoxanthine	Xanthine	Total	as uric acid	#
Eggs								
	Chicken egg	0	ND	0	0	0	0	A
	Quail egg	0	ND	0	ND	0	0	A
Dairy Products								
	Cheese	2.7	3	0	0	5.7	6.7	A
	Grated cheese	8.2	4.2	ND	0.6	12.9	15.4	A
	Milk	0	0	0	0	0	0	A
	Yoghurt	1.4	2.1	1.5	0.2	5.2	6.2	A
Mushrooms								
	Bunapii	12.2	12.3	3.2	3	30.8	36.2	A
	Bunashimeji	9.4	8	1.1	2.3	20.8	24.6	A
	Enokidake	29.7	19.6	0	0	49.4	58.8	A
	Eringi	5	5.3	0.7	2.4	13.4	15.7	A
	Hatakeshimeji	9.1	5.7	0.7	0.5	16	19.1	A
	Hiratake	74.3	68	0	0	142.3	168.1	C
	Jew's-ear (dried)*	54.8	93	7.9	0	155.7	181.4	C
	Maitake	47.4	38.9	7.9	4.4	98.5	116.7	B
	Nameko	14.9	13.6	ND	0	28.5	33.6	A
	Nameko (big type)	3.8	2.9	1.4	1.3	9.5	11.2	A
	Shiitake (dried)*	202.7	167.7	0	9.1	379.5	448.8	E
	Shiitake (for broth, dried)*	132.5	97.8	11.5	0.5	242.3	288.4	D
	Shiitake (raw)	8.3	10	1.6	0.9	20.8	24.4	A
	Shiitake No.115 (raw)	5.5	7.6	0.5	2.1	15.6	18.2	A
	Shiitake No. 240 (raw)	10.6	11	4.5	0	26.1	31	A
	Shiitake No. 697 (raw)	9.9	12.5	6.1	1	29.5	34.9	A
	Tsukuritake	28.4	21.2	0	0	49.5	58.8	A
	Usu-hiratake	16.8	15.7	1.9	3.5	37.9	44.6	A
	White aragekikurage	2.3	4.1	0.4	0.1	6.9	8	A
	White hiratake	27	32.8	0.6	4.3	66.7	78.1	B
	Yamabushitake	12.1	20.7	0.7	0	33.5	38.9	A
	Yanagimatsutake	6.1	11.9	4.9	3.3	26.2	30.5	A
Fruits								
	Banana	1.2	1.7	0.1	0	3	3.5	A
	Strawberry	0.5	1.2	0.5	0	2.1	2.4	A

Table 3. Amount of Purines in Vegetables (mg/100 g)

Foodstuffs	Part	Adenine	Guanine	Hypoxanthine	Xanthine	Total	as uric acid	#
Asparagus	Upper	20.7	30.5	3.8	0.3	55.3	64.7	B
Asparagus	Lower	3.6	4.8	1.7	0.1	10.2	12	A
Avocado		10.6	7.5	0.3	0	18.4	12.8	A
Balsam pear (goya)		3.5	4.3	1.1	1	9.9	11.6	A
Bamboo shoot	Upper	24.8	35.2	2.8	0.6	63.3	74	B
Bamboo shoot	Lower	12.8	17	0.7	0.4	30.8	36.1	A
Bean sprouts		14.1	14.2	3.2	3.5	35	41.2	A
Broccoli		25.1	33.9	5.7	5.3	70	81.8	B
Broccoli sprout		59.5	57.2	8.1	4.8	129.6	153	C
Cabbage		1.3	1.7	0.2	0	3.2	3.8	A
Carrot		0.7	1.4	0	0	2.2	2.5	A
Cauliflower		27	30.2	ND	0	57.2	67.2	B
Cherry tomato		1.6	1.5	0	0	3.1	3.7	A
Chinese cabbage		2.6	2.9	1.2	0.3	7	8.2	A
Corn		4.7	6.9	0.1	0.1	11.7	13.7	A
Cucumber		4.2	5	0.1	0.1	9.4	11.1	A
Eggplant		11	31.6	6.6	1.6	50.7	58.7	B
Garlic		6	6.9	3.4	0.7	17	20.1	A
Garlic chives (nira)		9.4	8.5	1.4	0.1	19.4	23	A
Ginger		0.4	1.4	0	0.5	2.3	2.5	A
Green pepper		15.9	35.5	7	10.7	69.2	79.8	B
Gumbo (okura)		17.2	21.3	0.3	0.7	39.5	46.3	A
Japanese ginger (myoga)		3.1	3.5	0.7	0.4	7.8	9.2	A
Japanese leek (negi)		12	26.8	2.6	0	41.4	48	A
Japanese pumpkin		32.2	29.1	1.9	2.5	56.6	66.3	B
Komatsuna	Leaf	4.2	6.3	0	0	10.6	12.3	A
Komatsuna	Young Leaf	13	24.7	0	1.4	39	45.1	A
Onion		1	1.1	0.1	0	2.3	2.7	A
Parsley		121.5	135.1	32.3	0	288.9	341.3	D
Perilla leaves (shiso)		19.1	19.1	3.1	0.2	41.4	49	A
Potato		2.1	4.2	0.2	0	6.5	7.5	A
Spinach	Leaf	29.8	13.8	0	7.7	51.4	61	B
Spinach	Young Leaf	83.5	88.3	0	0	171.8	202.1	C
Sprouts (with bean)		28.1	28.2	0	1.1	57.3	67.4	B
Sweet potato		6.7	7.3	2.4	0.6	17	20.1	A
White radish sprouts		33.9	29.4	6.4	3.5	73.2	86.6	B
Zucchini		5	6.3	1	0.8	13.1	15.3	A

Table 4: Amount of Purines in Animal Meat and Processed Meat (mg/100 g)

	Foodstuffs	Part	Adenine	Guanine	Hypoxanthine	Xanthine	Total	as uric acid	#
Meat									
	Beef	Brisket	13.5	7.6	49	9.1	79.2	95.8	B
		Clod	18.9	9.1	65.3	10.6	104	126.1	C
		Heart	45.9	27.2	96.6	15.2	185	223.6	C
		Kidney	67.6	63.5	8.2	35	174.2	203.4	C
		Large intestine	27.1	38.6	15.2	7.3	88	103.3	B
		Liver	86.5	83.1	ND	50.2	219.8	255.5	D
		Neck	18.9	13.6	54.4	13.7	100.6	121	C
		Ribloin	13.5	7.6	39.5	13.7	74.2	89.1	B
		Shin	17.6	13.6	58.5	16.7	106.4	127.8	C
		Shoulder ribs	14.9	9.1	36.7	16.7	77.4	92.5	B
		Shoulder sirloin	16.2	9.1	55.8	9.1	90.2	109.3	B
		Stomach	28.4	21.2	17.7	16.7	83.9	99.2	B
		Tenderloin	16.2	9.1	64	9.1	98.4	119.4	B
		Tongue	24.3	12.1	44.9	9.1	90.4	109.3	B
		Topside	18.9	10.6	72.1	9.1	110.8	134.5	C
		Topside (raw)	20.3	15.1	77.3	22.5	135.2	162.4	C
		Topside (heated)	27.1	15.8	87.2	13.3	143.5	173.8	C
	Chicken	Breast	20.5	21.4	98.4	1	141.2	171.8	C
		Buttocks	17	21.9	23.2	6.7	68.8	81.6	B
		Gizzard	45.9	51.4	39.5	6.1	142.9	169.8	C
		Heart	31.3	36.1	52.6	5.4	125.4	150	C
		Leg	27	19.6	76.2	0	122.9	149.6	C
		Liver	121.6	151.1	ND	39.5	312.2	363.1	E
		Skin	48.6	43.8	27.2	ND	119.7	142.9	C
		White meat	27	16.6	110.2	0	153.9	188.3	C
		Wing	28.4	16.6	92.5	0	137.5	168.1	C
	Horse		10	10	77.8	15.2	113.1	136.5	C
	Mutton	Mutton	17.6	10.6	68.1	ND	96.2	117.7	B
		Rum	17.6	10.6	65.3	ND	93.5	114.3	B
	Pork	Heart	39.2	24.2	55.8	0	119.2	144.6	C
		Kidney	64.8	77.1	53.1	0	195	232	C
		Liver	81.1	102.1	34	66.9	284.8	331.2	D
		Neck	14.9	12.1	43.6	0	70.5	85.7	B
		Ribs	13.5	10.6	51.7	0	75.8	92.5	B
		Rump	20.3	15.1	77.6	0	113	137.8	C
		Shoulder	16.2	12.1	53.1	0	81.4	99.2	B
		Shoulder ribs	16.2	10.6	64	0	90.8	110.9	B
		Shoulder sirloin	18.9	13.6	62.6	0	95.1	116	B

		Shoulder knee	21.6	16.6	69.4	0	107.6	131.1	C
		Sirloin	17.6	12.1	61.2	0	90.9	110.9	B
		Tenderloin	23	15.1	81.7	0	119.7	146.2	C
		Tongue	24.3	21.2	58.5	0	104	126.1	C
	Whale	Body meat	18.9	12.1	80.3	ND	111.3	136.2	C
		Tail Meat	12.1	6	68.1	ND	87.6	107.6	B
Processed Meat									
	Bacon		12.2	6	43.6	ND	61.8	75.6	B
	Boneless ham		10.8	7.6	55.8	0	74.2	90.8	B
	Corned beef		8.1	6	31.3	1.5	47	57.2	A
	Frankfurt sausage		8.1	7.6	32.7	1.5	49.8	60.5	A
	Liver paste		25.7	30.2	15	9.1	80	94.1	B
	Pressed ham		8.1	4.5	51.7	0	64.4	79	B
	Prosciutto (Parma ham)		23.4	22.8	92.1	0	138.3	168.2	C
	Salami		16.2	13.6	83	7.6	120.4	146.2	C
	Vienna sausage		6.8	6	32.7	ND	45.5	55.5	A

Table 5 - Amount of Purines in Fresh Fish, Fish Roe, Fish Milt, Shellfish, and Mollusks (mg/100 g)

	Foodstuffs	Part	Adenine	Guanine	Hypo xanthine	Xanthine	Tot	as uric acid	#
Fresh Fish									
	Arabesque greenling		18.9	34	94.7	2.4	150	181	C
	Ayu		17.6	25.7	89.8	0	133.1	161.4	C
	Barracuda		13.5	24.2	110.2	ND	147.9	179.9	C
	Bastard halibut		17.6	15.1	100.7	0	133.4	163.1	C
	Bonito		21.6	19.6	170.1	0	211.4	258.9	D
	Carp		16.2	12.1	74.9	ND	103.2	126.1	C
	Chub mackerel		13.5	10.6	98	0	122.1	149.6	C
	Fat greenling		20.3	13.6	95.3	ND	129.1	158	C
	Flying fish		13.5	22.7	118.4	0	154.6	188.3	C
	Gnomefish	Meat	14.6	15.3	120.1	0.8	150.8	184.4	C
	Gnomefish	Skin	9.6	296.7	73.5	2.5	382.3	435.5	E
	Herring		13.5	22.7	103.4	ND	139.6	169.8	C
	Jack mackerel		17.6	48.4	99.4	0	165.3	198.4	C
	Japanese amberjack		18.9	12.1	89.8	0	120.8	147.9	C
	Japanese eel		13.5	24.2	54.4	ND	92.1	110.9	B
	Japanese seabass		13.5	12.1	93.9	0	119.5	146.2	C
	Mebaru		13.5	18.1	92.5	0	124.2	151.3	C
	Monkfish	Meat	17.5	19.5	32.6	0.5	70	84.2	B
	Monkfish	Liver (raw)	38.2	55.6	6	4.4	104.3	121.8	C
	Monkfish	Liver (steamed)	158.2	211.4	26.6	3.1	399.2	468.2	E
	Pacific saury		14.9	52.9	87.1	0	154.9	184.9	C
	Rainbow trout		25.7	55.9	99.4	ND	180.9	216.8	C
	Red seabream		13.5	10.6	104.8	0	128.9	158	C
	Sablefish	Meat	27.4	11.9	83.9	0.2	123.3	151.1	C
	Sablefish	Skin	12.1	14	39.2	1.6	66.9	80.8	B
	Sailfin sandfish		16.2	30.2	49	3	98.5	117.7	B
	Salmon		17.6	10.6	91.2	0	119.3	146.2	C
	Sardine		17.6	105.8	87.1	ND	210.4	247.1	D
	Sillaginidae		13.5	10.6	119.8	ND	143.9	176.5	C
	Spanish mackerel		12.2	6	121.1	ND	139.3	171.5	C
	Striped pigfish		13.5	10.6	125.2	ND	149.3	183.2	C
	Tilefish		9.5	10.6	99.4	0	119.4	146.2	C
	Tuna		17.6	10.6	129.3	0	157.4	193.3	C
	Wakasagi smelt		13.5	24.2	57.2	0	94.8	114.3	B
	Weather loach		28.4	49.9	51.7	6.1	136	161.4	C

	Yellow striped flounder		14.9	28.7	69.4		0	113	136.2	C
Fish Roe & Milt										
	Caviar		7.5	46.1	39.4		1.7	94.7	111.1	B
	Flying fish roe (in soy sauce, Tobiko)		21.3	47.7	20.4		2.2	91.5	107.1	B
	Flying fish roe (Tobiko)		9.9	14.5	41.4		2.1	67.8	81.8	B
	Herring roe (Kazunoko)		6.8	15.1	0		0	21.9	25.2	A
	Salmon roe (Ikura)		0	0	2.5		1.1	3.7	4.4	A
	Pollock roe (marinated, Mentaiko)		32.9	81	36.9		8.6	159.3	186	C
	Pollock roe (Tarako)		35.1	66.5	19.1	ND		120.7	141.2	C
	Salmon roe (Sujiko)		4.1	7.6	4.1	ND		15.7	18.5	A
	Milt (Striped pigfish)		67	211.5	19.4		7.7	305.5	351.1	E
Shellfish & Mollusk										
	Botan shrimp		8.3	16.4	28.7		0	53.4	64	B
	Botan shrimp (roe)		75	53	34.5		0	162.5	194.9	C
	Clam		63.5	39.3	12.2		30.4	145.5	171.5	C
	Common orient clam		45.9	24.2	5.4		28.9	104.5	122.7	C
	Crab	Ovary	42.5	105.8	3.9		0	152.2	175.4	C
	Firefly squid		51.4	57.6	15.6		3.4	128.1	151.2	C
	Japanese flying squid		47.3	21.2	80.3		38	186.8	223.6	C
	Japanese scallop		63.6	6.6	5.3		1	76.5	94.2	B
	Kuruma shrimp		58.1	15.1	87.1		35	195.3	235.3	C
	Octopus		21.6	18.1	36.7		60.8	137.3	159.7	C
	Octopus	Organs	29.1	42	4.8		4	79.8	93.1	B
	Okiami (Krill)		108.1	74	17.7		25.9	225.7	267.3	D
	Oriental shrimp		40.5	12.1	103.4		117.1	273.2	321.1	D
	Oyster		55.4	34.8	12.2		82.1	184.5	213.5	C
	Red king crab		56.7	19.6	9.5		13.7	99.6	119.4	B
	Sakura shrimp (dried)*		83.9	124	512.2		29	749.1	907	E
	Sea cucumber		3.2	2.1	0.2		0	5.5	6.6	A
	Sea Urchin		40	65.7	22.5		9.1	137.3	160.7	C
	Shiba shrimp		43.2	16.6	84.4	ND		144.2	176.5	C
	Shredded squid (dried)*		24.9	20.6	47.9		1	94.4	114.2	B
	Snow crab		75.7	13.6	0		47.2	136.4	161.4	C
	Spear squid		58.1	15.1	34		53.2	160.5	190	C
	Spiny lobster		31.1	9.8	61.2		0.1	102.1	125.2	C
	Squid	Organs	0	17.1	22.1		20.4	59.6	68.8	B

Table 6: Amount of Purines in Seasonings and Supplements (mg/100 g)

Foodstuffs	Part	Adenine	Guanine	Hypoxanthine	Xanthine	Total	As uric Acid	#
Barbecue sauce		0.1	0	14.6	0.2	14.9	18.4	A
Frying powder		10.6	21.8	31.9	4.4	68.7	81.8	B
Honey		0.7	0.1	0	0	0.9	1.1	A
Mirin		0	0.2	0.5	0.5	1.2	1.4	A
Miso	Red miso	3.6	18	36.5	5.4	63.5	75.6	B
Miso	White miso	0	16.4	29.3	3	48.8	57.8	A
Nampla		0	0.8	82	10.3	93.1	113.6	B
Oyster sauce		12.9	23.1	87.1	11.3	134.4	161.8	C
Powder soup*	Consomme	18.3	82.9	72.8	5.8	179.8	211.3	C
Powder soup*	Potage	8.1	6.6	21.1	1.8	37.6	45.5	A
Powder soup*	Clam chowder	5.6	12.5	28.4	0.6	47.1	56.6	A
Powder soup*	Chinese soup	15.4	17.3	141.1	12.2	185.9	226.1	C
Powder soup*	Matsutake	5.7	112.8	113.7	1.2	233.4	274.4	D
Powdered Umami broth*		6.8	19.5	657	1.5	684.8	843.3	E
Rice bran		36.1	57.2	6	0.9	100.2	116.9	C
Soy sauce	Dark color	0	2.5	33.7	9	45.2	54.3	A
Soy sauce	Light color	0.7	5	28.5	21	55.3	64.9	B

APPENDIX 6

THE FAST RELIEF FIELD GUIDE & TOOLKIT FOR ACUTE GOUT ATTACKS

Don't panic … this attack will end!

In the meantime, we've put together an action list to help manage and hasten the duration of your pain and discomfort.

First Priority

The first moment you become aware that a gout attack is happening then immediately mix together an old folk remedy that has been used by many people to remove gout pain quickly. A word of caution – follow the guidelines exactly since increasing the dose or taking this too often can cause electrolyte imbalance. The use of bicarbonate of soda is definitely not a mainstream medical approach for gout although it is used by some practitioners for renal failure and severe acidosis.[28]

Quick Alkalinizing Folk Remedy

Mix together

- ½ Teaspoon Baking Soda (It's the same as Bicarbonate of Soda)
- Half a glass of pure filtered water

Take on an empty tummy twice daily – preferably in the morning and early evening

Only take this remedy for the duration of your acute attack since long-term use can cause serious metabolic imbalances. If your pain has not abated within 24 hours then discontinue using this particular remedy and try some of the other tools outlined below.

Low-Level Laser Therapy

Book an appointment for a medical laser treatment and find out whether this can work for you. If it does it will be one of the best treatments you can have to block pain and help reduce crystal deposits too. Make sure to follow the guidelines covered in Chapter 3.

If you find relief with the laser then we definitely recommend that you invest or hire one that you can use at home on demand. It is probably one of the best investments you could make to treat pain and many other muscular-skeletal disorders.

It's Herbal Tea Time - Designed to Relax and Relieve Pain

Jasmine & Green Herbal Tea

Place the following into a teapot for 3 cups of tea

- 2 Tablespoons of loose Jasmine Flowers or 2 sachets of Jasmine Flower tea
- 1 Tablespoon of loose green tea or 1 sachet green tea
- 3 fresh leaves of spearmint or mint

Add boiling water and let your tea steep for 5 minutes

Drink when cool enough

Notes:

- Avoid green tea after 16h00 because it contains caffeine and may interfere with the quality and duration of your sleep which is very important at this time. You can replace it with Holy Basil Tea (Tulsi) to relieve stress if you are feeling tense.
- You can also replace Jasmine Tea with Willow Bark which is nature's natural aspirin and helps to block pain quickly.
- Make sure to save 1 cup of your herbal tea to make a Cherry Smoothie for fast pain relief.
- Jasmine flowers contain salicylates that act like aspirin without negative side effects
- Spearmint/mint has anti-inflammatory properties
- Green tea has multiple health benefits for gout sufferers – see Chapter 3
- Variations include replacing mint with curcumin, which is a powerful pain inhibitor without harmful side effects like NSAIDs

Five Spice Chai Tea for Gout

Ingredients

- 10 Teaspoons Cinnamon powder (Non- irradiated)
- 2 Teaspoons Ginger root powder
- ½ Teaspoon clove powder
- 1 Teaspoon Cayenne powder
- 12 Teaspoons Turmeric Powder

Mix all the ingredients together to make a Chai Mix tea powder

Store in a sealed glass jar

To make a cup of Five Spice Chai Tea

- Add 1 Teaspoon of your Five Spice Chai mix to a stainless-steel pot
- Add 200ml organic free-range milk
- Bring to the boil then remove from your stove and pour into your favorite mug

- Sweeten with Honey or Stevia (Optional)

This drink is therapeutic, soothing, warming and pain busting at the same time - Enjoy!!!

Teas for Sleep

Chamomile Flowers, Jasmine Flowers & Rooibos Herbal Tea
Place the following into a teapot for 3 cups of tea

- 1 Tablespoons of loose Jasmine Flowers or 2 sachets of Jasmine Flower tea
- 1 Tablespoon of loose Chamomile Flowers or 2 sachet Chamomile tea
- 1 Teaspoon Rooibos loose tea leaves

Add boiling water and let your tea steep for 5 - 10 minutes
Drink when cool enough.
It's best taken half an hour before retiring to bed.

Note: If you still can't sleep then take Melatonin as a supplement for the duration of your attack and then slowly taper off the amount. Speak to your favorite health practitioner to make sure that this is a healthy option for you and the best dose to suit your needs.

Cherished Cherry Smoothie for Intense Pain Management

Ingredients

- 227 g Red Cherries – wash and remove inner pips
- 1 cup Jasmine Herbal Tea

NB: At the start of an acute Gout Flare-up you may benefit by adding

- 1 Teaspoon Apple Cider Vinegar
- ½ Pineapple – outer skin removed and sliced for the blender (optional)

Method

- Place the following ingredients into a blender
- Blend together and drink half immediately and the balance within 4 – 6 hours
- Repeat daily for up to 3 months to balance uric acid balance

Notes:

5. Tart dark cherries are the best but all have potent benefits for gout.
6. Cherries act as powerful natural painkillers because they block COX 1 & 2 pain pathways. They also contain strong Xanthine Oxidase inhibitors, medicinal molecules that help reduce uric acid production in an acute gout attack. Refer to Chapter ??? for all the details.
7. Jasmine tea (Blocks pain pathways) and Green tea (xanthine oxidase inhibitor, relaxing, potent polyphenols) both have profound pain-relieving effects.

8. Pineapples contain a digestive enzyme (Bromelein) that reduces uric acid levels in gout.

DIY Gout Pain Massage Oil

Make your own topical ointment to help with fast pain relief by massaging the affected joint(s).

Ingredients

- 12 drops Frankincense Essential Oil
- 12 drops lemon Essential Oil
- 8 drops Roman Chamomile Essential Oil
- 2 Tablespoons Grapeseed oil
- Small amber glass dropper bottle

Method

- Put all the ingredients into the glass dropper bottle and gently but thoroughly mix these together.
- Place 8 drops onto the palm of your hand and gently apply to the painful joint. Lightly massaging the oil into the skin for about 3 minutes.

Notes:

1. Store in a cool dry cupboard
2. Make sure that you are in a warm environment without a breeze to avoid getting cold when you apply the oil.

Gout Pain Relief Cream

This cream does take some effort to make as you may have to order in the ingredients from a reputable health store, however, it is definitely worth the effort!

Ingredients

- ¼ cup shea butter
- 2 tbsp coconut oil
- 10 drops Frankincense essential oil
- 10 drops Rosemary essential oil
- 10 drops Roman Chamomile essential oil
- 5 drops lemon oil

Equipment

- Double boiler to melt the coconut oil and shea butter
- Hand whisk
- Small glass amber jar

Method

1. Melt the shea butter and coconut oil together in a double boiler.

2. Pour into a glass bowl and let it set in the refrigerator for 20 minutes.
3. When set, add all the essential oils to the bowl.
4. Mix well with a hand whisk until everything blends to make a creamy consistency.
5. Scoop your pain cream into your glass amber jar and use on painful gout areas when needed.

Supplements for Acute Attacks – Great Tips

The following supplement suggestions are vital for an acute gout attack. We recommend that you take these for at least 3 months following your flare-up.

- Vitamin C powder (Buffered) Dose: 2 grams taken 3 times daily

Note: If you experience diarrhea then reduce the dosage by half

- Resveratrol Dose: Follow upper limit of manufacturers dosing guideline
- Omega-3 Rich Fish Oil Dose: Follow manufacturers guide
- Mega potent Vitamin B Dose: Follow manufacturers guide
- Melatonin Dose: 9 – 20 mg for the first week Afterwards reduce down until you are no longer taking it. Best taken 5 nights weekly half an hour before bedtime
- Zinc Picolinate Dose: 1 tablet (22 mg) after breakfast
- Curcumin Dose: Follow manufacturers guide

Important Reminders

Avoid **All** Purine content foods for 1 - 3 months following a severe acute gout attack.

- This means all alcohol and all foods high in Purine listed in Appendix 5.

Try to avoid most acidic foods listed in Appendix 1 – select alkaline foods and drinks from appendix 1 instead.

Eat prebiotic-rich foods (fiber) – fermented foods such as unfiltered organic apple cider vinegar, sauerkraut, and celery and apple smoothies as much as possible (Consider these as your new comfort foods that protect your microbiome and provide super health benefits to quickly overcome your condition)

Don’t do exercise during this period and limit movement of the affected joint as much as possible.

Avoid being cold, dress warmly and have warm baths with 8 drops of both Frankincense and chamomile added.

APPENDIX 7

Powerful Natural Tools for Gout

(Grouped By Action)

In this appendix, we list almost all the compounds that are good for gout and group them together according to their main activity in the body. Typically, by action we mean whether it works mainly as a xanthine oxidase inhibitor, or antioxidant, supports the microbiome, or some other mechanism. This should be a helpful shorthand resource for easy reference.

Xanthine Oxidase Inhibitors (XO⇩)

- Vitamin C
    - Also antioxidant, anti-inflammatory, kidney filtration rate increase
- Caffeinated Coffee
    - Caffeine is an XO⇩, also *antioxidant* - polyphenols, chlorogenic acids in green coffee extract.
- Celery - also an antioxidant, anti-inflammatory, and digestive aid
- Cherries - Also Analgesic, antioxidant and anti-inflammatory
- Herbs
    - Chinese cinnamon (*Cinnamomum cassia)*
    - *Guldaudi (Chrysanthemum indicum)*
    - *Bugleweed (Lycopus europaeus)*
    - *A type of knotweed in the buckwheat family called Polygonum cuspidatum which contains high amounts of the potent antioxidant* polyphenol called *resveratrol*.
    - Beleric – as powerful as allopurinol in inhibiting XO (also reduces inflammation)
    - Green tea (primarily antioxidant, contains caffeine & polyphenols which inhibit XO)
    - Israeli Chamomile (*Anthemis palestina Boiss*) - 51.5% inhibition
    - Yellow Milfoil (*Achillea biebersteinii Afansiev*) - 45% inhibition.
    - Rosemary (*Rosmarinus officinalis L.*) - 42% inhibition.
    - Ginkgo (*Ginkgo biloba*) - 39.2% inhibition.
    - Lavender (*Lavandula angustifolia*) - 28.7% inhibition.
    - Marjoram (*Majorana syriaca*) - 25.1% inhibition.
    - Spearmint (*Mentha spicata*) -22.5% rate of inhibition.
- Papain from papaya

Antioxidants / Anti-inflammatory

- Garlic/Aged Garlic contains:
    - Allicin - also antimicrobial, immune-supportive
    - Ajoene - anticancer
- Celery & Seed extracts - [ALSO a XO⇩] Increases urine production, decrease pain and inflammation – flavonoids
- GLA / EPA DHA – Getting your Omega's sorted
- Borage Seed Oil (Increases HDL, Reduces LDL and triglycerides)
- Blackcurrant seed oil (anti-inflammatory, reduces pain in arthritis)
- Evening Primrose Oil (cumulative effect, reduces inflammation and pain)
- Fish oil for Omega-3 anti-inflammatory and all the rest. Entered under stress section.
- Flavonoids
    - Extracts from olive leaves, milk thistle preparations, and other sources of the biochemicals "apigenin", "myricetin", "Luteolin", and "genistein"
      (ALSO Xanthine Oxidase inhibitors - some as good as allopurinol)
    - Quercetin (found in onions, apples, berries, and other foods), curcumin (found in turmeric), rutin (found in buckwheat), kaempferol (grapes, gingko biloba, broccoli, and tomatoes), myricetin, and puerarin can all reduce uric acid levels.[29] [30]
    - Grape seeds and grape seed extract have uric acid lowering properties with studies showing that the compounds in grape seed preparations were significantly more beneficial than using allopurinol.[31]
    - White Mulberries (reduces uric acid, helps kidneys get rid of UA, anticancer, heart health and much more besides)
- Bromelain from Pineapple
- Cold Laser / LLLT
    - Reduces inflammation, swelling, chronic pain & acute pain, increases blood flow, improves cell growth & cell stimulation, helps wound healing
- Quercetin - See above
- Green tea - Xanthine Oxidase Inhibitor, contains L-theanine for relaxation)

Microbiome Support

- Fiber (soluble and total fiber)
    - Cholesterol-lowering, antihypertensive, hyperuricemia risk reductions
- Probiotics
    - (*Lactobacillus helveticus* [*L. helveticus*] and *Bifidobacterium longum* [*B. longum*] for stress)

OTHER

- FOLATE (B9) - Reduces gout risk (70%), and lowers Homocysteine levels
- B Vitamin Complex - With breakfast is helpful in a diet where animal products are reduced
- Zinc polynicotinate - Helps support the liver and immune system
- Magnesium - Consider a magnesium topical spray for affected joints
- Adaptogenic Herbs for stress
    - Licorice (Glycerrhiza glabra), Ginseng, Rhodiola, Cordyceps, **Ashwagandha**, **Basil**, Bacopa, Chisandra
- Sedative herbs for stress
    - Hops, passionflower, valerian, chamomile, and poppy
- Meditation (Great for multiple body systems…stress)
- Exercise (Great for multiple body systems…stress)
- DHEA
    - For stress and mood – If you have been under stress in your life then this supplement is really helpful. Men 50 mg daily and Ladies 25 mg; Take only 5 days per week and only for a period of 3 months at a time

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